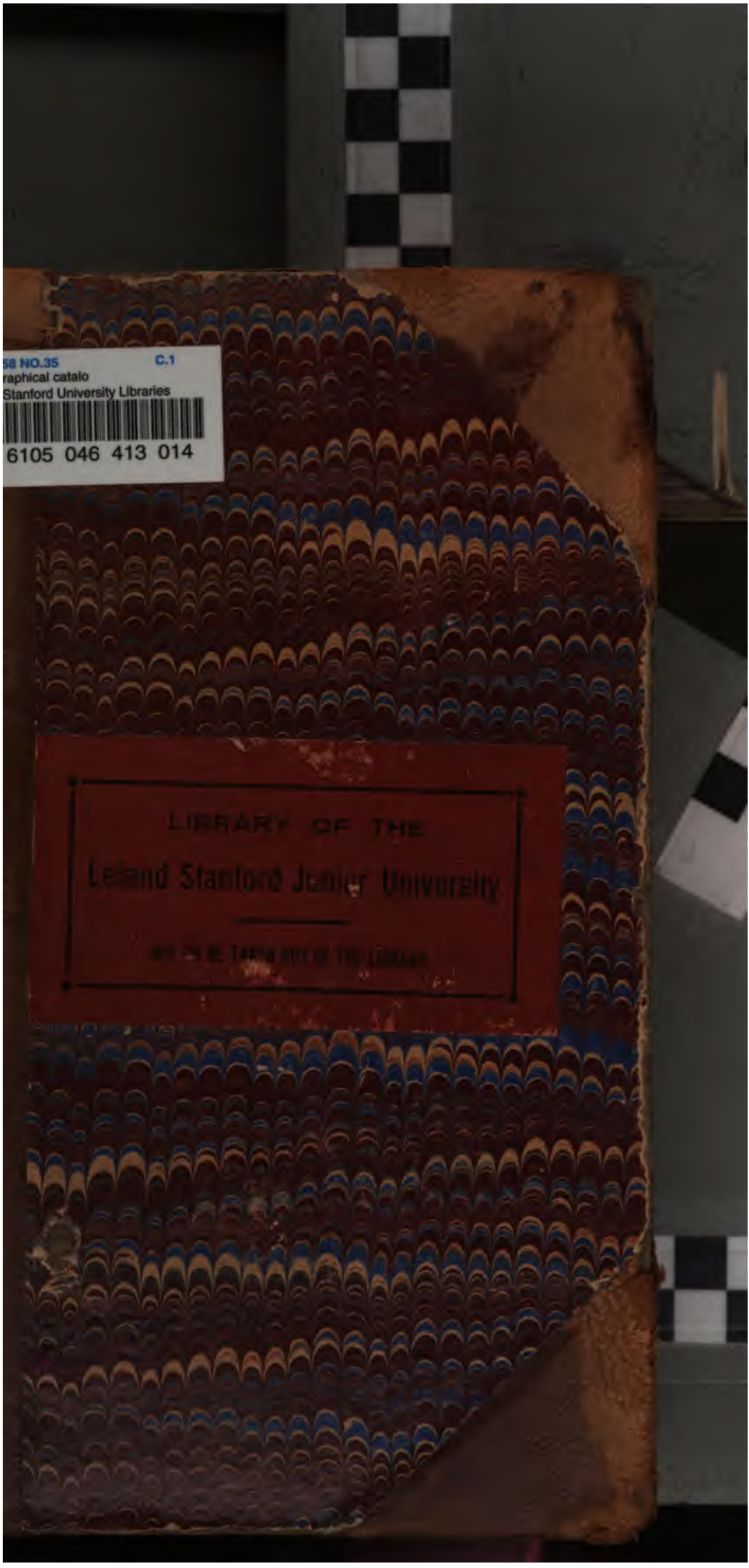

SMITHSONIAN INSTITUTION

UNITED STATES NATIONAL

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEU

No.

DESCRIBED TRANSFORMA

BIBLIOGRAPHICAL

LEPIDOPTERA.

BY

Y EDWARDS.

SMITHSONIAN INSTITUTION.

UNITED STATES NATIONAL MUSEUM.

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 35.

BIBLIOGRAPHICAL CATALOGUE OF THE DESCRIBED TRANSFORMATIONS OF NORTH AMERICAN LEPIDOPTERA.

BY

HENRY EDWARDS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1889.

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S. P. LANGL

BIBLIOGRAPHICAL CATALOGUE

OF THE

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PREFACE.

I believe that the present Catalogue will supply a want that has long been felt by many entomologists, and though it may be far from perfect, it will, I trust, be acceptable to the students of the earlier stages of North American Lepidoptera. In its compilation I have occupied a good portion of the spare time at my command for three years past, and have carefully examined every publication that has been accessible to me. I know that many references may possibly have been omitted, the works in which they occur not being within my reach, but I trust that few if any *species* have been overlooked altogether. Should such be the case, however, I shall be greatly indebted to my entomological friends if they will point them out to me, as it is my intention to issue a supplement to this list once a year, and thus keep up with the knowledge of what descriptions have been recorded. In the nomenclature I have followed the catalogue of W. H. Edwards in the *Diurnæ;* Grote's Check List (1882) in the *Macro-Lepidoptera;* Professor Fernald in the *Tortricidæ;* Stainton, Clemens, and Chambers in the *Tineidæ;* and Lord Walsingham in the *Pterophoridæ.* Of the two latter families no catalogue of our species exists, and I therefore ask for indulgence should any errors in the sequence of the genera or otherwise be detected. It has been my aim to make the references as clear but at the same time as brief as possible, and I have, as will be seen, arranged all descriptions according to the date of their publication. When the words (quotes Harris, *e. g.*) occur after the name of the describer, it will be understood that the *text* of the description has been used; but when the words (*after* Riley or Abb. Sm., etc.) are found, it will mean that the *drawing* or *engraving* has been borrowed from these authors. In all the species, where known to me, the food-plant has been given, except in the case of the *Arctias* and in *Agrotis*, the former being almost general feeders, and the latter living chiefly on grasses and low herbaceous plants. If a reference is followed by the word (brief), it signifies that the same is but a mere mention, often perhaps only a food-plant, but it has been deemed advisable to include such notices. In the appendix are a few species not referable to any known insects, and I have added a short list of some papers which may be of value to the students of transformations. I should like also to call attention to the admirable "life histories" by Messrs. Riley, French, Edwards, Saunders, Packard, H. H. Clark, and others, which are scattered through Entomological Reports, both State and National, the Canadian Entomologist, "Papilio," "Entomologica Americana," and kindred publications, papers which may advantageously be studied by future

describers as models of style and accuracy. I desire to tender my warmest thanks to Professor Riley, Mr. S. H. Scudder, Mr. J. B. Smith, Mr. W. H. Edwards, and Mr. W. Beutenmüller for much valuable aid, both in the loan of publications and the copying of references, thus greatly assisting me in my task.

I earnestly hope that the publication of this catalogue will be the means of inducing observers to take a wider and more extended interest in the preparatory stages, and to place as early as possible upon record the results of their studies. It will be readily seen that though, up to the end of the *Bombycidæ*, a good deal has already been done, the knowledge of the transformations of the *Noctuidæ* and succeeding families is slight indeed, and it is to these groups that attention is especially directed. Should this list be instrumental in adding to our information regarding the many species of Lepidoptera, of whose earlier stages we now know so little, my labor will be rewarded, and the many hours passed in its preparation will not have been occupied in vain.

HENRY EDWARDS

NUMBER OF SPECIES OF WHICH EARLIER STAGES ARE RECORDED IN THIS CATALOGUE.

NAME.	No. of species.
Rhopalocera	180
Sphingidæ	55
Ægeriadæ	16
Zygænidæ	13
Bombyces	178
Noctuidæ	188
Geometridæ	101
Pyralidæ	39
Tortricidæ	61
Tineidæ	222
Pterophoridæ	16
Total	1,069

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Species General, Heterocera.
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Insects Abroad.

ERRATA.

Page 17, line 10 from top—read *Astragalus, Crotalaria* for *Astragalus crotalaria.*
Page 20, line 19 from top—read *Argynnis* for *Argynis.*
Page 21, line 13 from top and line 27 from bottom—read *Castilleia* for *Castileja* and *Castelejia.*
Page 45, line 7 from top—read *Ulmus americana* for *Ulmus americanus.*
Page 58, line 21 from top—read *Œnothera* for *Ænothera.*
Page 61, line 6 from top—read *Asclepias tuberosa* for *Asclepias tuberosum.*
Page 64, line 3 from top—read *Quercus* for *Quercus.*
Page 67, top line—read *Thyridopteryx* for *Thyridoptery.*
Page 94, line 22 from top—read *Cruciferæ* for *Crucifercæ.*
Page 94, line 27 from top—read *Anarta* for *Ararta.*
Page 109, line 1 from bottom—read *Fuchsia* for *Fuschia.*
Page 112, line 1 from bottom—read *Oxycoccus* for *Occycoccus.*

DESCRIBED TRANSFORMATIONS OF NORTH AMERICAN LEPIDOPTERA.

RHOPALOCERA.

Papilio ajax. L. (and vars.)

1797. Larva, chrys., (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, pl. 4.
1833. Larva, chrys., (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pp. 4–8, pl. 1–2.
1836. Larva. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, pp. 257–259.
1859. Larva, chrys., (figs.) *P. H. Gosse.* Letters from Alabama, p. 51.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 209.
1871. Life hist., (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 1st series, pl. Papilio, 1, 2, 3.
1880. Larva. *Miss N. Middleton.* Trans. Dep't Agr. Ill., vol. 18, Appendix, p. 74.
1884. Larva, (figs.) *Dr. A. Gruber.* Jena. Zeitschr. Nat. Copied in Papilio, vol. 4, p. 88.
1886. Life hist., (condensed.) *G. H. French.* Butt. East. U. States, p. 85.

FOOD PLANT. *Asimina triloba.* (Pawpaw.)

Papilio philenor. Fab.

1797. Larva. *Abbot—Smith.* Lep. Ins. Georgia, pl. 3.
1833. Larva, (col'd figs.) *Boi·duval—Leconte.* Hist. Lep. N. Amer., p. 29, pl. 11.
1836. Larva, chrys. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 325.
1837. Larva, chrys. *Westwood,* (quotes Abb.-Sm.) Drury's Ill. Exot. Entom., vol. 1, p. 21.
1861. Larva. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 6.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 209.
1869. Larva, chrysalis, (figs.) *Harris.* Entom. Corres., p. 273.
1870. Life history, (figs.) *Riley.* 2d Missouri Rept., p. 116.
1873. Larva, chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc.
1874. Chrysalis, (fig.) *Scudder.* Geology N. Hampshire, pl. A.
1875. Chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 162.
1877. Larva. *G. H. French.* Trans. Dept. Agr. Ill., vol. 15, p. 136.
1880. Larva, (figs.) *D. W. Coquillett,* (quotes Riley.) Trans. Dept. Agr. Ill., vol. 18, Appendix, p. 164.
1880. Larva, (figs.) *Miss N. Middleton.* Trans. Dept. Agr. Ill., vol. 18, Appendix, p. 73.
1880. Larva, chrysalis, (figs.) *W. Saunders.* Rept. Entom. Soc. Ontario, p. 37.
1881. Life hist. *W. H. Edwards.* Canad. Entom., vol. 13, p. 9.
1881. Larva, chrysalis, (figs.) *S. H. Scudder.* Butterflies, their structure, etc., p. 22.
1884. Larva, (figs.) *Dr. A. Gruber.* Jena Zeitschr. Nat. Copied in Papilio, vol. 4, p. 88.
1886. Life history, (figs.) *G. H. French.* Butt. East. U. States, p. 88.

FOOD PLANTS. Species of *Aristolochia.*

Papilio zolicaon. Bdv.

1873. Larva, chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 163.
1875. Larva, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Papilio, 6.
1884. Life hist. *W. H. Edwards.* Papilio, vol. 4, p. 162.

FOOD PLANTS. Species of *Umbelliferæ.*

Papilio brevicauda. Saund.

1873. Egg, young larva, (figs.) *H. Strecker*, (quotes Couper in lit.) Rhopal. et Heteroc, pp. 49–69, pl. 8.
1875. Egg, larva (col'd fig.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Papilio, 8.
1880. Life hist., (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, part 9, pl. Papilio, 8.
1883. Larva. *P. H. Gosse*, in Journal from 1832 to 1835. Canad. Entom., vol. 15, p. 45.
1884. Larva, (brief.) *Gruber.* Jena Zeitschr. Nat. Copied in Papilio, vol. 4, p. 86.
1885. Egg, larva. *W. H. Edwards*, (quotes Couper in lit.) Butt. N. Amer., 2d series, pl. 13.

FOOD PLANTS. Various species of *Umbelliferæ.*

Papilio machaon. L. var. **aliaska.** Scud.

1884. Larva, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. 14.

FOOD PLANT. Species of *Umbelliferæ.*

Papilio oregonia. Edw.

1882. Larva, chrysalis. *R. H. Stretch.* Papilio, vol. 2, p. 120.

FOOD PLANT. "Wild parsnip."

Papilio asterias. Tab.

1833. Larva, chrys., (col'd figs) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 14, pl. 4.
1836. Larva, chrys. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 333.
1841. Life history, (brief.) *Harris.* Ins. Inj. Vegetat., 1st edit., p. 212.
1852. Life history, (brief.) *Harris.* Ins. Inj. Vegetat., 2d edit., p. 231.
1857. Larva, chrysalis, (figs.) *Anonymous.* Canad. Nat. and Geolog., vol. 2, p. 222.
1861. Larva. *Morris*, (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 6.
1862. Life history, (col'd figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 263, pl. 4.
1864. Egg, larva, chrysalis. *Lintner.* Proc. Entom. Soc. Phila., vol. 3, p. 51.
1864. Larva, (fig.) *Jaeger.* Life N. Amer. Ins., p. 208.
1867. Larva, chrys., (figs.) *Sanborn Tenney.* Manual of Zoology, figs. 281, 282.
1869. Larva. *Harris.* Entom. Corres., p. 270.
1873. Larva, chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 164.
1876. Larva. *Saunders.* Rept. Entom. Soc. Ontario, p. 38.
1877. Larva. *Packard.* Inj. Ins. West, Hayden's Rept., p. 765.
1877. Larva. *G. H. French.* Trans. Dept. Agr. Ill., vol. 15, p. 137.

1857. Larva, chrysalis, (figs.) *Anonymous.* Canad. Nat. and Geolog., vol. 2, p. 312.
1861. Larva. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 5.
1862. Larva, chrysalis. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 266.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 209.
1869. Larva. *Saunders.* Canad. Entom., vol. 1, p. 73.
1869. Larva, stages of. *Harris.* Entom. Corres., p. 271, pl. 2 and 4.
1877. Larva, chrysalis. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 138.
1880. Larva. *Miss N. Middleton.* Trans. Dept. Agr. Ill., vol. 18, App., p. 74.
1881. Larva, chrys. *Gundlach.* Entom. Cubana, p. 136.
1881. Chrysalis, (figs.) *Scudder.* Butterflies, their structure, etc., p. 44, pl. 60.
1884. Larva. *Dr. A. Gruber.* Jena Zeitschr. Nat. Copied in Papilio, vol. 4, p. 87.
1886. Larva, chrysalis. *French.* Butt. East. U. States, p. 93.

FOOD PLANTS. *Laurus, Sassafras.*

Papilio palamedes. *Drury.*

1833. Larva. *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 17, pl. 5.
1836. Larva, chrys. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 338.
1837. Larva. *Westwood,* (quotes Bois.) Drury's Ill. Exot. Entom., vol. 1, p. 36.
1861. Larva. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 7.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 210.
1881. Life history. *W. H. Edwards.* Canad. Entom., vol. 13, p. 119.
1886. Life hist., (condensed.) *French.* Butt. East. U. States, p. 95.

FOOD PLANTS. *Laurus, Citrus.*

Papilio turnus. L.

1833. Larva, (col'd fig.) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 19, pl. 7.
1836. Larva, chrysalis. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 339.
1840. Larval stages, chrysalis. *P. H. Gosse.* Canad. Naturalist, pp. 249, 293.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 341.
1857. Larva, chrysalis. *Anonymous.* Canad. Nat. and Geolog., vol. 2, p. 223.
1861. Larva. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 2.
1862. Larva, chrysalis, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 268.
1863. Larva. *B. D. Walsh.* Proc. Entom. Soc. Phila., vol. 1, p. 352.
1863. Chrysalis. *J. A. Lintner.* Proc. Entom. Soc. Phila., vol. 3, p. 51.
1869. Egg, larval stages. *Saunders.* Canad. Entom., vol. 1, pp. 51, 74.
1873. Life hist., (brief.) *Saunders.* Rept. Entom. Soc. Ontario, p. 21.
1874. Life history. *Saunders.* Canad. Entom., vol. 6, p. 2.
1876. Larva. *G. H. Perkins.* 2d Rept. Vermont State Board Agric., p. 589.
1877. Life hist., (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Papilio, 3.
1877. Larva. *Packard.* Half-hours with Insects, p. 180.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 139.
1879. Larva, (figs., brief.) *Saunders.* Rept. Entom. Soc. Ontario, p. 73, fig. 4.
1880. Larva. *Miss N. Middleton.* Trans. Dept. Agr. Ill., vol. 18, p. 74.
1880. Larva. *D. W. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, p. 173.
1883. Egg, larval stages, chrysalis (figs.) *Saunders.* Ins. Injur. Fruits, p. 83.
1884. Egg, larva, chrysalis (figs.) *Fernald.* Butt. of Maine, p. 21.
1884. Larva. *Dr. A. Gruber.* Jena Zeitschr. Nat. Copied in Papilio, vol. 4, p. 86.
1886. Life history, (figs. larva and chrys.) *French.* Butt. East. U. States, p. 100.

FOOD PLANTS. *Prunus, Cerasus, Liriodendron.*

Papilio turnus, dim. form, **glaucus,** L.

1833. Larva, chrysalis. *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 22, pl. 9.

1836. Larva, chrys. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 336.
1856. Larva. *Fitch.* 3d Rept. Inj. Ins. N. York, p. 376.
1859. Larva, (brief.) *P. H. Gosse.* Letters from Alabama, p. 123.
1877. Young larva, (col'd fig.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Papilio, 4.
1881. Egg, (fig'd.) *Scudder.* Butterflies, their structure etc., p. 7.

Papilio eurymedon. Bois.

1833. Larva, (col'd fig.) *Titian Peale.* Lep. Americana, pl. 1.
1873. Larva, chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 164.
1874. Larva, chrysalis, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Papilio, 1.

FOOD PLANT. *Rhamnus californicus.*

Papilio rutulus. Bdv.

1870. Larva, chrysalis. *S. H. Scudder.* Proc. Boston Soc. Nat. Hist., vol. 19, p. 221. (Printed as P. eurymedon in error.)
1873. Chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 165.
1878. Larva. *T. L. Mead.* Psyche, vol. 2, p. 180.
1882. Larval stages. *Hy. Edwards.* Papilio, vol. 2, p. 112.
1883. Larval stages. *W. H. Edwards.* Papilio, vol. 3, p. 2.
1885. Life history, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. 12, 13.

FOOD PLANTS. *Alnus viridis, Salix sp.*

Papilio daunus. Bdv.

1833. Larva, (col'd fig.) *Titian Peale.* Lep. Americana, pl. 1.
1873. Chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 325.
1883. Larva. *W. H. Edwards.* Papilio, vol. 3, p. 2.
1884. Larva. *W. Schaus, jr.* Papilio, vol. 4, p. 100.

FOOD PLANTS. *Prunus, Cerasus.*

Papilio pilumnus. Bdv.

1884. Larva, chrysalis. *W. Schaus, jr.* Papilio, vol. 4, p. 100.

FOOD PLANT. "Feeds on Laurel."

Papilio cresphontes. Cram.

1833. Larva. *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 31, pl. 12, 13, (as P. thoas.)
1836. Larva, chrys. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 356.
1859. Larva. *P. H. Gosse,* (quotes Bois.) Letters from Alabama, p. 170, (as P. thoas.)

Papilio polydamas. L.

1836. Larva. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 321.
1861. Larva. *Morris,* (quotes Boisduval.) Synop. Lep. N. Amer., p. 13.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 210.
1878. Larva, chrys., (figs.) *H. Dewitz.* Wiegemann Archiv. Naturgesch., p. 2, fig. 1.
1878. Larva, chrys. *Dewitz.* Zeitsch. gesament. natur.
1879. Larva, chrys. *Dewitz.* Zeitsch. gesament. natur.
1881. Larva, chrys. *Gundlach.* Entom. Cubana, p. 121.

FOOD PLANT. *Aristolochia.*

Parnassius clodius. Men.

1879. Egg, young larva. *W. H. Edwards,* (as P. Baldur.) Canad. Entom., vol. 11, p. 142.
1885. Egg, young larva. *W. H. Edwards.* Canad. Entom., vol. 17, p. 64.
1886. Egg, larva. *H. J. Elwes,* (quotes Edw.) Proc. Zoöl. Soc. London, Jan., p. 51.

FOOD PLANTS. *Sedum, Saxifraga.*

Parnassius smintheus. Dby. and Hew.

1872. Egg, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 1st series, pl. 3 of Parnassius.
1875. Egg, young larva. *T. L. Mead.* Rept. on Lep. of Wheeler Exped'n. Geolog. Survey, vol. 5, p. 743.
1876. Egg, young larva. *W. H. Edwards.* Canad. Entom., vol. 11, p. 141.
1883. Egg, larva. *W. H. Edwards.* Papilio, vol. 3, p. 158.
1885. Life history. *W. H. Edwards.* Canad. Entom., vol. 17, p. 61.
1886. Egg, young larva. *H. J. Elwes,* (quotes Edw.) Proc. Zoöl. Soc. London, p. 23.

FOOD PLANTS. *Sedum, Saxifraga.*

Parnassius behrii. Edw.

1878. Larval stages. *T. L. Mead.* Psyche, vol. 2, p. 181.

FOOD PLANT. *Sedum.*

Neophasia menapia. Felder.

1873. Chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc. vol. 5, p. 165.
1882. Egg, larva. *R. H. Stretch.* Papilio, vol. 2, p. 103.

FOOD PLANTS. *Pinus ponderosa, P. contorta, Abies balsamii.*

Pieris monuste. L.

1833. Larva. *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 43, pl. 16.
1836. Larva, chrys. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 497.
1861. Larva, chrysalis. *Morris,* (quotes Bois. and Lec.) Synop. Lep. N. Amer., p. 17.
1881. Larva, chrys. *Gundlach.* Entom. Cubana, p. 101.
1883. Egg, larva, chrys., (fig.) *Riley.* Rept. U. S. Dept. Agr., pp. 117–118, pl. 10, fig. 1.
1886. Egg, larva, chrysalis. *G. H. French.* Butt. East. U. States, p. 107.

FOOD PLANTS. Species of *Cruciferæ.*

Pieris beckeri. Edw.

1878. Larva, chrysalis. *T. L. Mead.* Psyche, vol. 2, p. 183.
1883. Life hist., (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pt. 11, pl. 1 of Pieris.

FOOD PLANTS. Various species of *Cruciferæ.*

Pieris sisymbrii. Bdv.

1878. Larva. *T. L. Mead.* Psyche, vol. 2, p. 184.
1883. Life hist., (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pt. 11, pl. 1 of Pieris.

FOOD PLANTS. Species of *Cruciferæ.*

Pieris protodice. Bois.–Lec.

1870. Life hist., (figs.) *C. V. Riley.* 2d Missouri Rept., p. 104.
1870. Larva, chrysalis, (fig'd.) *Townend Glover.* Rept. U. S. Dept. Agr., 1

1870. Larva, chrys. *C. I. Minot.* Amer. Entom. vol. 2, p. 77.
1871. Larva, chrysalis, (fig'd.) *Bethune.* Rept. Entom. Soc. Ontario, p. 425.
1873. Life hist. *Saunders.* Canad. Entom., vol. 5, p. 43.
1874. Larva, chrys. *Hy. Edwards,* (quotes C. I. Minot.) Proc. Cal. Acad. Sci., vol. 5, p. 327.
1877. Larva, chrysalis, (fig'd.) *G. H. French.* Trans. Dept. Agr. Ill., vol. 15, p. 141.
1877. Larva, chrysalis, (figs.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 750.
1879. Larval stages, (figs.) *Cyrus Thomas.* Trans. Dept. Agr. Ill., vol. 17, Appendix, p. 25.
1880. Larva, (fig'd.) *Miss N. Middleton.* Trans. Dept. Agr. Ill., vol. 18, Appendix, p. 77.
1880. Larva, (fig'd.) *D. W. Coquillett,* (quotes Riley.) Trans. Dept. Agr. Ill., vol. 18, p. 178, App.
1882. Larva, chrysalis, (fig'd.) *Scudder.* Butt., their structure, etc., p. 21.
1882. Larva. *Saunders.* Canad. Entom., vol. 14, p. 1.
1882. Larva, (fig'd.) *Saunders.* Rept. Entom. Soc. Ontario, p. 14.
1883. Egg, larva, chrys., (figs.) *Riley.* Rept. U. S. Dept. Agr., pp. 114–115; pl. 10, figs. 2–4.
1886. Life history, (condensed) (figs.) *G. H. French.* Butt. East. U. States, p. 109.

FOOD PLANTS. Species of *Cruciferæ*, especially *Brassica.*

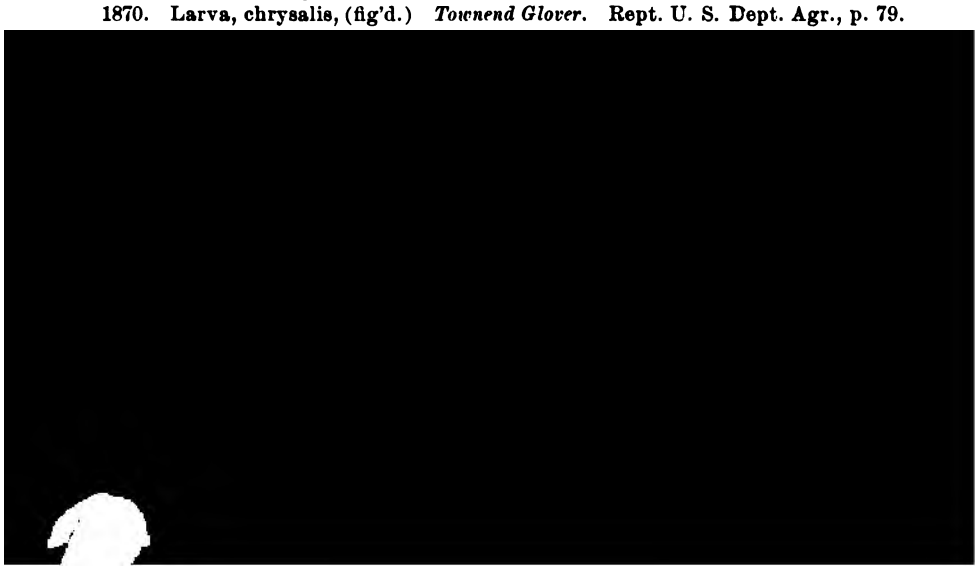
Pieris napi. Esper.

1828. Larva, chrys. *Stephens.* Illust. Brit. Entom., Haust., vol. 1, p. 20.
1836. Larva, chrys. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 519.
1859. Larva, chrys. *Edw. Newman.* Butt. Young England, p. 5.
1886. Life history, (figs.) *French.* Butt. East. U. States, p. 11.

FOOD PLANTS. Species of *Cruciferæ.*

Pieris oleracea. Harris.

1829. Larva. *Harris.* New England Farmer, vol. 7, p. 402. (Entom. Corres., p. 361, pl. 4.)
1841. Larva, chrys. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 214.
1850. Larva. *Harris.* Agassiz' Lake Superior, p. 386.
1852. Life history, (brief.) *Harris.* Ins. Inj. Vegetat., 2d edit., p. 233.
1854. Larva. *Emmons.* Natural Hist. N. York. Agriculture, vol. 5, p. 205.
1857. Egg, larva, (brief.) *Anonymous.* Canad. Nat. and Geolog., vol. 2, p. 347.
1862. Egg, larva, chrysalis. *Harris* Ins. Inj. Vegetat., Flint's edit., p. 270.
1864. Larva, chrysalis. *Lintner.* Proc. Entom. Soc. Phila , vol. 3, p. 54.
1869. Life history. *Fitch.* 13th Rept. Ins. N. Y., p. 531.
1869. Chrysalis, (fig.) *Harris.* Entom. Corres., pl. 4.
1870. Larva, chrysalis, (fig'd.) *Townend Glover.* Rept. U. S. Dept. Agr., p. 79.



1859. Larva, chrys. *Edw. Newman.* Butt. Young England, p. 5.
1869. Life history. *Fitch.* 13th Rept. Ins. N. York, p. 543.
1870. Larva, chrys., (figs.) *T. Glover.* Rept. U. S. Dept. Agr., p. 78, fig. 38.
1870. Life history, (figs.) *C. V. Riley.* 2d Missouri Rept., p. 106.
1871. Larva, (fig.) *Bethune.* Rept. Entom. Soc. Ontario, p. 423.
1872. Larva, chrysalis, (figs.) *Townend Glover.* Rept. Entom. N. York State Agr. Assoc., p. 82, fig. 15.
1873. Larva, (fig'd.) *A. J. Cook.* 12th Rept. Michigan Board Agr., p. 120, fig. 16.
1873. Life history. *Saunders.* Canad. Entom., vol. 5, p. 42.
1875. Egg, larva, chrysalis, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 31.
1877. Larva, chrysalis. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 145.
1877. Larva, chrysalis, (figs.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 747.
1877. Larva, (fig'd.) *Packard.* Half Hours with Insects, p. 54.
1878. Egg, larva, chrysalis, (fig'd.) *J. Stauffer.* Agr. Pennsylv.
1879. Larva, (fig'd.) *Hiram Cutting.* Pests of Farmer, New Hampshire Board Agr., p. 34.
1879. Larval stages. *Cyrus Thomas,* (quotes Curtis and others.) Trans. Dept. Agr. Ill., vol. 17, pp. 10–25.
1880. Larva, chrysalis, (fig'd.) *Miss N. Middleton.* Trans. Dept. Agr. Ill., vol. 18, p. 77, App.
1880. Larva, (fig.) *D. W. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, p. 179, App.
1881. Larva, chrysalis, (fig'd.) *Scudder,* (after Riley.) Butt., their structure, etc., p. 124, fig. 112.
1882. Larva and chrysalis. *Saunders.* Canad. Entom., vol. 14, p. 2.
1882. Larva, chrysalis, (brief.) *W. F. Kirby.* European Butt. and Moths, p. 8.
1883. Egg, larva, chrys., (figs.) *Riley.* Rept. U S. Dept. Agr., pp. 108–113, pl. 1, figs. 1–1d.
1884. Egg, larva, chrysalis. *Fernald.* Butt. of Maine, p. 27.
1885. Chrysalis, (fig.) *Hy. Edwards.* Standard Nat. Hist., vol. 2, p. 495.
1886. Life history, (figs.) *French.* Butt. East. U. States, p. 115.
1887. Larva. *J. Fletcher.* Rept. Ent. Dept. Agr. Canada, p. 16.
1888. Larva, (brief.) *J. Fletcher.* Rept. Ent. Bot. Dept. Agr. Canada, p. 16.
FOOD PLANTS. Species of *Cruciferæ.*

Pieris occidentalis. Reakt.
1888. Chrysalis. *Hy. Edwards.* Entom. Amer., vol. 3, p. 162.

Anthocharis lanceolata. Bdv.
1878. Larva. *T. L. Mead.* Psyche, vol. 2, p. 183.
FOOD PLANT. *Turritis glabra.*

Anthocharis ausoniedes. Bdv.
1874. Larva. *Hy. Edwards,* (quotes T. L. Mead in lit.) Proc. Cal. Acad. Sc., vol. 5, p. 326.
1874. Egg, larva, chrysalis, (col'd figs.) *W. H. Edwards,* (quotes T. L. Mead in lit.) Butt. N. Amer., 2d series, pl. 2 of Anthocharis.
1885. Larva, chrysalis. *W. H. Edwards.* Butt. of N. Amer., 2d series, pl. 13.
FOOD PLANTS. Species of *Cruciferæ.*

Anthocharis hyantis. Edw.
1878. Larva. *T. L. Mead.* Psyche, vol. 2, p. 183.

Callidryas eubule. L.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, pl. 5.
1833. Larva, (col'd fig.) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 74, pl. 24.
1836. Larva, chrysalis, (col'd figs.) *Boisduval.* Spec. Gener. Diurnæ, vol. 1, pp. 614–615, pl. 2.
1842. Larva, (col'd fig.) *Duncan.* Natural. Libr., vol. 21, p. 123.
1862. Larva. *Morris,* (quotes Boisd.) Synop. Lep. N. Amer., p. 26.
1873. Larva, (brief.) *Butler,* (quotes Abb.–Sm.) Monogr. Callidryas, p. 1.
1881. Larva, chrysalis. *Gundlach.* Entom. Cubana, p. 115.

FOOD PLANT. *Cassia.*

Callidryas sennæ. L.

1725. Larva, chrysalis. *Sloane.* Hist. Jamaica, p. [illegible]

1832. Larva, chrysalis. *Boisduval.* [illegible] Lep. [illegible]

1855. Larva, chrysalis. *Sepp.* Surinaamsche Vlinders, 1, p. 19. (as Pap. Hyperici.

1873. Larva, chrysalis. *Butler*, quotes Sloane. Monogr. Callidryas, p. 17.

1873. Larva, chrysalis. *Butler*, quotes Sepp. Monogr. Callidryas, p. 16.

1886. Larva, (brief. *French.* Butt. East. U. States, p. 125.

FOOD PLANT. *Cassia.*

Callidryas philea. L.

1873. Larva, chrysalis, brief. *Butler.* Monogr. Callidryas, p. 22.

1888. Chrysalis. *Hy. Edwards.* Entom. Amer., vol. 3, p. 182.

Colias eurydice. Bdv.

1876. Larva, chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 7, p. 61.

1883. Life history. *W. H. Edwards.* Canad. Entom., vol. 15, p. 224.

FOOD PLANT. *Amorpha californica.*

Colias cæsonia. Stoll.

1833. Larva. *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 67, pl. 22.

1836. Larva. *Boisduval.* Spec. Gener. [illegible] p. 636.

1862. Larva. *Morris*, (quotes Boisduval. Synop. Lep. N. Amer., p. 27.

1874. Larva. *Hy. Edwards*, (quotes Boisduval. Proc. Cal. Acad. Sc., vol. 5, p. 327.

1880. Larva. *Miss N. Middleton.* Trans. Dept. Agr. Ill., vol. 18, p. 78, App.

1881. Larva, chrysalis. *Gundlach.* Entom. Cubana, p. [illegible]

1886. Larva, (brief.) *French.* Butt. East. U. States, p. 128.

1888. Life history. *W. H. Edwards.* Canad. Entom., vol. 20, p. 21.

FOOD PLANTS. *Trifolium, Amorpha.*

Colias meadii. Edw.

1889. Life history. *W. H. Edwards.* Canad. Entom., vol. 21, p. 41.

Colias eurytheme. Bdv.

1869. Egg, larva, chrysalis. *W. H. Edwards*, (quotes J. K. Hayhurst.) Butt. N. Amer., 2d series, Colias No. 3.

1872. Egg, larva, chrysalis. *W. H. Edwards.* Supplem. Notes to Butt. N. Amer.

1878. Egg, larval stages, (figs. *W. H. Edwards.* Butt. N. Amer., 2d series, Colias No. 4.

1880. Larva. *Miss N. Middleton.* Trans. Dept. Agr. Ill., vol. 18, p. 78, App.

1886. Life history, (condensed. *G. H. French.* Butt. East. U. States, p. 131.

FOOD PLANT. *Trifolium.*

1881. Egg, larva, chrysalis. *Fernald.* Butt. of Maine, p. 31.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 134.
FOOD PLANTS. *Trifolium, Astragalus.*

Colias scudderii. Reak.
1872. Young larva. *W. H. Edwards.* Butt. N. Amer., Colias, No. 8.

Colias alexandra. Edw.
1872. Egg. *W. H. Edwards.* Butt. N. Amer., Supplementary part.

Colias harfordii. (incl. C. Barbara ♀.)
1884. Life history. *W. H. Edwards.* Papilio, vol. 4, p. 2.
FOOD PLANT. *Astragalus crotalaria.*

Terias nicippe. Cram.
1833. Larva, (col'd fig.) *Titian Peale.* Lep. Amer., pl. 8.
1833. Larva. *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 55, pl. 20.
1836. Larva, chrysalis. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 654.
1855. Larva, chrysalis. *Townend Glover.* Trans. N. York State Agr. Soc., p. 105.
1856. Larva, chrysalis. *Chenu—Lucas.* Entom. Nat. Hist. Papillons, p. 60.
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 33.
1873. Chrysalis. *Hy. Edwards,* (quotes Bois.-Lec.) Proc. Cal. Acad. Sc. vol. 5, p. 166.
1880. Larva. *Miss N. Middleton,* (quotes Bois.-Lec.) Trans. Dept. Agr. Ill., vol. 18, p. 79, App.
1881. Larva, chrysalis. *Gundlach.* Entom. Cubana, p. 83.
1881. Life history. *W. H. Edwards.* Canad. Entom., vol. 13, p. 61.
1881. Chrysalis. *Scudder.* Butt., their structure, etc., p. 184.
1886. Larva, chrysalis. *French.* Butt. East. U. States, p. 137.
FOOD PLANT. *Cassia.*

Terias lisa. Bdv.
1833. Larva, chrysalis, (col'd fig.) *Bois.-Lec.* Hist. Lep. N. Amer., p. 53, pl. 19.
1836. Larva, chrysalis, (col'd fig.) *Boisduval.* Spec. Gener. Rhopaloc., vol. 1, pl. 2, p. 662.
1862. Larva. *Morris.* Synop. Lep. N. Amer., p. 34.
1874. Larva, chrys, (brief.) *Hy. Edwards,* (quotes Boisduval.) Proc. Cal. Acad. Sc., vol. 5, p. 327.
1880. Larva. *Miss Middleton,* (quotes Boisd.) Trans. Dept. Agr. Ill., vol. 18, p. 79, Append.
1886. Larva, (brief.) *French.* Butt. East. U. States, p. 139.
FOOD PLANTS. *Cassia, Trifolium.*

Terias delia. Cram.
1883. Larva. *Bois.-Lec.* Hist. Lep. N. Amer., p. 49, pl. 18.
1836. Larva, chrysalis. *Boisduval.* Spec. Gener. Diurnæ, vol. 1, p. 664.
1862. Larva. *Morris,* (quotes Bois.) Synop. Lep. N. Amer., p. 35.
1874. Larva, chrys, (brief.) *Hy. Edwards,* (quotes Boisduval.) Proc. Cal. Acad. Sc., vol. 5, p. 327.
1886. Larva, (brief.) *French.* Butt. East. U. States, p. 140.
FOOD PLANTS. *Cassia, Trifolium.*

Heliconia charitonia. L.
1850. Larva. *P. H. Gosse.* Note in Doubleday. Gen. Diur. Lep., vol. 1, p. 97.
1879. Larva, chrysalis. *Dewitz.* Zeitsch. gesament. natur.
1881. Larva. *W. H. Edwards.* Papilio, vol. 1, p. 209.
1881. Larva. *W. H. Edwards.* Canad. Entom., vol. 13, p. 158.
1881. Larva, chrysalis. *Gundlach.* Entom. Cubana, p. 21.
1882. Life history. *W. H. Edwards.* Butt. N. Amer., 2d series, part 10.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 142.
FOOD PLANT. *Passiflora.*

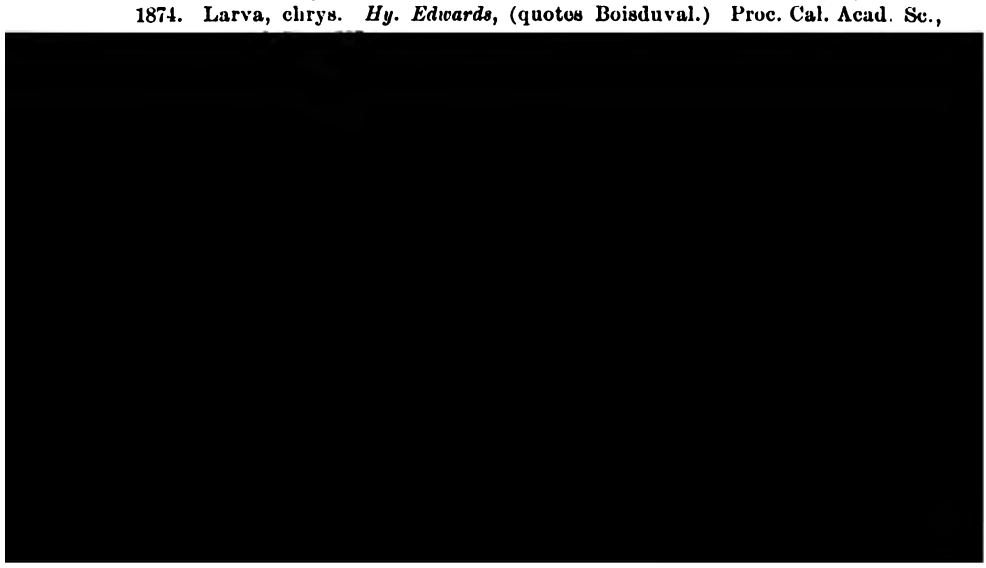
Danais archippus. Latr.

1797. Larva, chrysalis, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, pl. 6.
1828. Larva, chrys., (fig.) *Say.* Amer. Entom., vol. 3, pl. 54.
1833. Larva, (col'd figs.) *T. Peale.* Lep. Americana, pl. 7.
1833. Larva, chrys., (col'd figs.) *Bois.-Lec.* Hist. Lep. N. Amer., p. 137, pl. 40.
1840. Larva, chrys., (figs.) *Westwood.* Intr. Mod. Class. Ins., vol. 2, p. 352
1854. Larva, chrys., (col'd figs.) *Emmons.* Nat. Hist. N. York, vol. 5, pl. 38.
1857. Larva, chrys., (fig.) *Anon.* Canad. Nat. and Geol., vol. 2, p. 351.
1859. Larva, chrys. *P. H. Gosse.* Letters from Alabama, p. 185.
1862. Larva, chrys. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 38.
1862. Larva, pupa. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 280.
1869. Larva, chrysalis. *Saunders.* Canad. Entom., vol. 1, p. 75.
1870. Egg, chrysalis. *Saunders.* Canad. Entom., vol. 2, p. 148.
1871. Life history, (figs.) *Riley.* 3d Missouri Rept., p. 144.
1873. Larva, chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 166.
1873. Life history. *Saunders.* Canad. Entom., vol. 5, p. 4.
1876. Life history, (brief.) *W. H. Edwards.* Canad. Entom., vol. 8, p. 119.
1878. Life history. *W. H. Edwards.* Psyche, vol. 2, p. 176.
1878. Larva, chrys. *H. Dewitz.* Wiegemann Archiv. Naturgesch., p. 9, pl. 1.
1878. Larva, chrysalis. *Dewitz.* Zeitsch. gesament. natur.
1879. Larva, chrys., (figs.) *Mrs. I. P. Ballard.* Insect Lives, p. 24.
1879. Larva, chrys. *Dewitz.* Zeitsch. gesament. natur.
1880. Larva, (fig.) *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 161.
1880. Larva, (fig.) *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 80.
1881. Larva, chrys. *Gundlach.* Entom. Cubana, p. 23.
1881. Egg, larva, (figs.) *Scudder.* Butt., their structure, etc., pp. 10, 18, figs. 17, 18, 22.
1881. Chrysalis, (fig.) *Scudder.* Loc. cit., p. 44, fig. 61.
1884. Egg, larva, chrysalis, (figs.) *Fernald.* Butt. Maine, p. 35.
1885. Larva, chrys. *Hy. Edwards.* Kingsley's Stand. Nat. Hist., vol. 2, p. 492.
1886. Life history, (condensed,) (figs.) *French.* Butt. East. U. States, p. 144.
1888. Chrysalis, (fig.) *Grote.* 18th Rept. Entom. Soc. Ontario, p. 74.
1888. Larval stages, (fig.) *Lintner.* 4th Rept. N. Y. State Entom., p. 136.

FOOD PLANT. *Asclepias.*

Danais berenice. Cram.

1833. Larva, chrys., (figs.) *Bois.-Lec.* Hist. Lep. N. Amer., p. 134, pl. 39.
1862. Larva, chrys. *Morris,* (quotes Bois.-Lec.) Synop. N. Amer. Lep., p. 37.
1874. Larva, chrys. *Hy. Edwards,* (quotes Boisduval.) Proc. Cal. Acad. Sc.,



Argynnis, idalia. Drury.

1875. Egg, young larva. *W. H. Edwards.* Canad. Entom., vol. 7, p. 151.
1879. Life history, (brief.) *W. H. Edwards.* Canad. Entom., vol. 11, p. 217.
1880. Larva. *Coquillett,* (quotes Edw.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 162.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 81.
1884. Egg, larva. *Fernald.* Butt. Maine, p. 37.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 150.

Argynnis diana. Cram.

1872. Egg, (brief.) *W. H. Edwards.* Butt. N. Amer., Supplementary part.
1874. Larva. *W. H. Edwards.* Canad. Entom., vol. 6, p. 121.
1876. Life history, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. 7 of Argynnis.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 81.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 153.

Argynnis cybele. F.

1872. Egg. *W. H. Edwards.* Butt. N. Amer., supp. part.
1872. Larva, chrysalis. *Saunders.* Canad. Entom., vol. 4, p. 121.
1874. Larva. *W. H. Edwards.* Canad. Entom., vol. 6, p. 121.
1876. Life history. *W. H. Edwards.* Butt. N. Amer , 2d series, pl. Argynnis, No. 7.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 81.
1880. Life history. *W. H. Edwards.* Canad. Entom., vol. 12, p. 141.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 155.

Argynnis aphrodite. F.

1868. Larva, (brief.) *W. H. Edwards,* (quotes D. W. Beadle in lit.) Butt. N. Amer., 1st series, pl. Argynnis, No. 3.
1874. Larva. *W. H. Edwards.* Canad. Entom., vol. 6, p. 121.
1876. Life history. *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Argynnis, No. 7.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 81.

Argynnis hesperis. W. H. Edwards.

1888. Life history. *W. H. Edwards.* Canad. Entom., vol. 20, p. 67.

Argynnis edwardsii. Reakirt.

1888. Life history. *W. H. Edwards.* Canad. Entom., vol. 20, p. 3.

Argynnis alcestis. Edw.

1879. Life history. *W. H. Edwards.* Canad. Entom., vol. 12, p. 69.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 82.
1886. Life history. *French.* Butt. East. U. States, p. 159.

Argynnis atlantis. Edw.

1868. Larva, (brief.) *W. H. Edwards,* (quotes C. H. Shurtleff in lit.) Butt. N. Amer., pl. Argynnis, No. 5.
1869. Larva, chrysalis. *Packard.* Guide to Study of Ins., p. 252.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 82.
1881. Chrysalis, (fig.) *Scudder.* Butt., their structure, etc., p. 150.
1886. Chrysalis, (fig.) *French.* Butt. East. U. States, p. 161.
1888. Life history. *W. H. Edwards.* Canad. Entom., vol. 20, p. 3.

Argynnis eurynome. Edw.

1875. Egg, (col'd fig.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Argynnis, No. 1.

Argynnis egleis. Bois.

1879. Larva. *W. H. Edwards.* Canad. Entom., vol. 11, p. 53.
1879. Life history. *W. H. Edwards.* Canad. Entom., vol. 11, p. 177.
1880. Larva. *D. W. Coquillett,* (quotes Edwards.) Trans. Dept. Agr. Ill., vol, 18, Append., p. 164.

Argynnis myrina. Cram.

1869. Life history. *Saunders.* Canad. Entom., vol. 1, p. 55.
1869. Larva, chrysalis. *Packard,* (quotes Saunders.) Guide to Study of Ins., p. 254.
1874. Larva, chrys. *Hy. Edwards,* (quotes Saunders.) Proc. Cal. Acad. Sc., vol. 5, p. 328.
1875. Life history. *W. H. Edwards.* Canad. Entom., vol. 7, p. 189.
1876. Life history, (additional notes.) *W. H. Edwards.* Canad. Entom., vol. 8, p. 161.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 82.
1880. Larva. *D. W. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 161.
1881. Egg, (fig.) *Scudder.* Butt., their structure, etc., p. 8.
1884. Larval stages, (fig.) *Gruber.* Jena Zeitschr. Nat., copied in Papilio, vol. 4, p. 91.
1884. Egg, larva, chrysalis, (figs.) *Fernald.* Butt. Maine, p. 41.
1886. Egg, larva, chrysalis, (figs.) *French.* Butt. East. U. States, p. 162.

Argynnis montinus. Scud.

1874. Life history, (figs.) *Scudder.* Geology N. Hampsh., pl. A.

Argynis bellona. Fab.

1871. Egg. *Scudder.* Rept. Peabody Acad. Sc., p. 49.
1872. Life history. *Scudder.* Amer. Naturalist, vol. 6, p. 513.
1880. Life history, (notes on.) *W. H. Edwards.* Papilio, vol. 1, p. 134.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol 18, Append., p. 83.
1880. Larva. *D. W. Coquillett.* Trans. Dept. Agr. Ill., vol 18, Append., p. 183.
1884. Larva. *Fernald.* Butt. Maine, p. 41.
1888. Chrysalis. *Hy. Edwards.* Entom. Amer. vol. 3, p. 162.

FOOD PLANTS (of all the species of Argynnis). *Viola* of various species.

Euptoieta claudia. Cram.

1833. Larva, chrysalis, (figs.) *Bois.-Lec.* Hist. Lep. N. Amer., p. 153, pl. 44.
1855. Larva, chrysalis. *Townend Glover.* Trans. N. Y. State Agr. Soc., p. 105.
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 44.
1870. Larva. *W. H. Edwards.* Canad. Entom., vol. 2, p. 163.
1875. Egg, larva. *T. L. Mead.* Rept. Lepid. Wheeler Survey, vol. 5, p. 751.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 80.
1880. Life history. *W. H. Edwards.* Canad. Entom., vol. 12, p. 231.
1884. Larva, chrysalis. *Fernald,* (quotes W. H. Edwards.) Butt. Maine, p. 43.
1886. Life history, (brief.) *French.* Butt. East. U. States, p. 166.

FOOD PLANTS. *Viola, Passiflora, Sedum, Desmodium, Portulaca.*

[redacted]

1886. Life history, (figs.) *French*. Butt. East. U. States, p. 169.
FOOD PLANTS. *Chelonia glabra*, *Lonicera ciliata*.

Melitæa cooperi. Behr.
1863. Larva. *Behr*. Proc. Cal. Acad. Sc., vol. 3, p. 90.

Melitæa chalcedon. Doub.-Hew.
1863. Larva, chrysalis. *Behr*. Proc. Cal. Acad. Sc., vol. 3, p. 89.
1871. Larva, chrys., (col'd figs.) *W. H. Edwards*. Butt. N. Amer., pl. Melitæa, No. 1.
1873. Larva, chrysalis. *Hy. Edwards*. Proc. Cal. Acad. Sc., vol. 5, p. 167.
1883. Egg, larva. *W. G. Wright*. Papilio, vol. 3, p. 123.
1884. Larva and partial history. *W. H. Edwards*. Papilio, vol. 4, p. 63.
1885. Chrysalis. *Hy. Edwards*. Kingsley's Stand. N. Hist., vol. 2, p. 486.
FOOD PLANTS. *Mimulus*, *Castilleja*.

Melitæa nubigena. Behr.
1875. Larva, chrysalis. *T. L. Mead*. Rept. Lep. Wheeler Survey, vol. 5, p. 758.

Melitæa baroni. Hy. Edw.
1879. Larval stages. *W. H. Edwards*. Canad. Entom., vol. 11, p. 149.
1879. Life history. *W. H. Edwards*. Canad. Entom., vol. 11, p. 129.
1880. Larva. *Coquillett*, (quotes Edwards.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 163.
FOOD PLANTS. Species of *Scrophulariaceæ*.

Melitæa rubicunda. Hy. Edw.
1885. Larval stages. *W. H. Edwards*. Canad. Entom., vol. 17, p. 155.
FOOD PLANT. *Scrophularia*.

Melitæa editha. Bois.
1873. Larva, chrysalis. *Hy. Edwards*. Proc. Cal. Acad. Sc., vol. 5, p. 167.
FOOD PLANTS. *Erodium cicutarium*, *Trifolium*, *Viola*.

Melitæa palla. Bois.
1873. Larva, chrysalis. *Hy. Edwards*. Proc. Cal. Acad. Sc., vol. 5, p. 167.
FOOD PLANT. *Castelejia breviflora*.

Melitæa harrisii. Scud.
1877. Life history. *W. H. Edwards*. Canad. Entom., vol. 9, p. 165.
1877. Larva. *Scudder*. Psyche, vol. 1, p. 18.
1880. Larva. *Coquillett*, (quotes Edwards.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 162.
1881. Chrysalis, (fig.) *Scudder*. Butt., their structure, etc., p. 32.
1884. Life history. *French*. Butt. East. U. States, p. 170.
1884. Larva, chrysalis, (figs.) *French*. Butt. East. U. States, p. 170.
FOOD PLANT. *Diplopappus umbellatus*.

Melitæa minuta. Edw.
1879. Chrysalis. *W. H. Edwards*. Canad. Entom., vol. 11, p. 141.

Melitæa ismeria. Bois.-Lec.
NOTE.—There is still some doubt as to this species. I therefore give the references to its early stages.
1833. Larva, chrysalis, (figs.) *Bois.-Lec.* Hist. Lep. N. Amer., p. 168, pl. 46.
1862. Larva, chrysalis. *Morris*, (quotes Bois.-Lec.) Synop. Lep. N. Am., p. 50.

Phyciodes nycteis. Doub.-Hew.
1869. Life history, (figs.) *Lintner*. 23d Rept. N. York State Cab. N. Hist., p. 158, pl. 8.
1870. Larva. *W. H. Edwards*, (as P. Harrisii.) Canad. Entom., vol. 2, p. 163.
1872. Egg. *Saunders*, (as M. Harrisii.) Canad. Entom., vol. 4, p. 161.
1872. Larval stages. *Saunders*, (as M. Harrisii.) Loc. cit., p. 162.
1872. Larva. *Lintner*. Entom. Contrib., No. 1, p. 26.
1873. Larva. *W. H. Edwards*. Canad. Entom., vol. 5, p. 224.
1874. Larva, chrysalis. *Riley*. Proc. Amer. Ass. Adv. Sc., p. 108.
1875. Larva, chrysalis. *W. H. Edwards*. Canad. Entom., vol. 7, p. 151.

1879. Life history. *W. H. Edwards.* Canad. Entom., vol. 11, p. 101.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 83.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 165.
1884. Life history. *Gruber.* Jena Zeitschr. Nat., vol. 17, p. 478, pl. 8. Copie in Papilio, vol. 4, p. 90.
1884. Life history, (brief.) *Fernald.* Butt. Maine, p. 46.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 172.
FOOD PLANTS. Species of *Helianthus and Actinomeris.*

Phyciodes vesta. Edw.
1879. Life history. *W. H. Edwards.* Canad. Entom., vol. 2, p. 129.

Phyciodes camillus. Edw.
1884. Life history. *W. H. Edwards.* Papilio, vol. 4, p. 128.
FOOD PLANT. *Aster* of various species.

Phyciodes tharos. Drury. (incl. vars.)
1862. Chrysalis. *Harris.* Ins. Inj. Vegetat., Flint's ed., p. 290.
1875. Life history. *T. L. Mead.* Canad. Entom., vol. 7, p. 161.
1877. Life history. *W. H. Edwards.* Canad. Entom., vol. 9, pp. 1–51.
1878. Life history, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl Phyciodes, No. 1.
1878. Life history, (figs.) *Gruber.* Jena Zeitschr. Nat., vol. 17, p. 477, pl. 8.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append. p. 83.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 163.
1884. Larval stages. *Gruber.* Jena Zeitschr. Nat., vol. 17, copied in Papilio vol. 4, pp. 90–120.
1884. Egg, larva. *Fernald.* Butt. Maine, p. 48.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 178.
FOOD PLANT. *Actinomeris helianthoides.*

Phyciodes mylitta. Edw.
1873. Larva, chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 167.
1875. Larva, chrysalis. *T. L. Mead,* (quotes Hy. Edwards.) Rept. Le Wheeler Expd., vol. 5, p. 764.
FOOD PLANTS. *Carduus* (thistles) of various species.

Phyciodes picta. Edw.

1871. Life history, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Grapta, Nos. 4, 5.
1877. Larva, chrysalis. *Packard.* Inj. Ins. West, Hayden Rept., p. 774.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 152.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr., Ill., vol. 18, Append., p. 84.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 161.
1881. Chrysalis, (fig.) *Scudder.* Butt., their structure, etc., p. 258.
1881. Larva, chyrsalis. *Packard,* (quotes Saunders.) Ins. Inj. to Forest Trees, p. 65.
1882. Life history. *W. H. Edwards.* Canad. Entom., vol. 14, p. 201.
1884. Egg, larva, chrysalis. *Fernald.* Butt. Maine, p. 49.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 184.
1886. Chrysalis, (fig.) *French.* Butt. East. U. States, p. 184.

FOOD PLANTS. *Humulus, Ulmus, Urtica.*

Grapta comma. Harris, (incl. vars.)

1840. Larva, chrysalis. *P. H. Gosse.* Canad. Naturalist, pp. 221, 226, 280.
1841. Chrysalis. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 221.
1852. Larva, chrysalis. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 241.
1856. Larva. *Fitch.* 3d Rept. Ins. N. Y., p. 432.
1862. Larva, chrysalis. *W. H. Edwards.* Proc. Entom. Soc. Philad., vol, 1, p. 182.
1862. Chrysalis, (fig.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 301, pl. 4.
1862. Chrysalis. *Morris.* Synop. Lep. N. Amer., p. 54.
1864. Larva, chrysalis. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 55.
1871. Life history, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series., pl. Grapta, No. 2.
1871. Larva, chrysalis, (col'd figs.) *W. H. Edwards,* (var. dryas.) Loc. cit., pl. Grapta, No. 3.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 152.
1877. Larva. *Packard.* Inj. Ins. West, Hayden's Rept., p. 774.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 81.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 163.
1881. Larva, chrysalis. *Packard,* (quotes W. H. Edwards.) Ins. Inj. Forest Trees, p. 66.
1881. Egg, (fig.) *Scudder.* Butt., their structure, etc., p. 99.
1882. Life history. *W. H. Edwards.* Canad. Entom., vol. 14, p. 189.
1884. Egg, larva, chrys. *Fernald.* Butt. Maine, p. 51.
1886. Life history. *French.* Butt. East. U. States, p. 186.

FOOD PLANTS. *Humulus, Ulmus, Urtica.*

Grapta satyrus. Edw.

1872. Larva, chrysalis, (col'd fig.) *W. H. Edwards,* (quotes Stretch M. S.) Butt. N. Amer., 2d series, pl. Grapta, No. 6.
1873. Larva. *Hy. Edwards,* (quotes Stretch, MS.) Proc. Cal. Acad. Sc., vol. 5, p. 168.
1873. Chrysalis. *Hy. Edwards.* Loc. cit., p. 168.
1875. Larva. *C. W. Pearson.* Canad. Entom., vol. 7, p. 216.

FOOD PLANT. *Urtica.*

Grapta rusticus. Edw.

1879. Larva, chrysalis, (col'd fig.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Grapta, No. 3.

Grapta faunus. Edw.

1864. Larva, chrysalis. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 58.
1875. Larva. *Caulfield.* Canad. Entom., vol. 7, p. 49.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 81.
1881. Chrysalis, (fig.) *Scudder.* Butt., their structure, etc., p. 12.
1884. Egg, larva. *Fernald.* Butt. Maine, p. 52.

1884. Chrysalis, (fig.) *Fernald.* Loc. cit., p. 52.
1886. Larva. *French.* Butt. East. U. States, p. 188.
1886. Chrysalis, (fig.) *French.* Loc. cit., p. 188.
FOOD PLANT. *Salix.*

Grapta silvius. Edw.

1873. Larva, chrysalis. *Hy. Edwards,* (as G. zephyrus in error.) Proc. Cal. Acad. Sc., vol. 5, p. 169.
FOOD PLANT. *Azalea occidentalis.*

Grapta zephyrus. Edw.

1879. Larva, chrysalis, (col'd fig.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Grapta, No. 3.

Grapta progne. Cram.

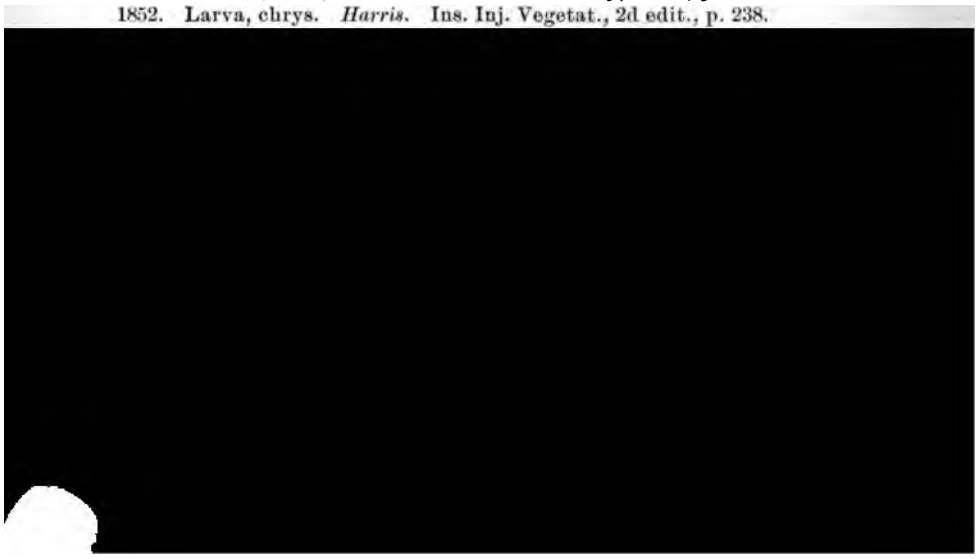
1840. Larva, chrys. *P. H. Gosse.* Canad. Naturalist, p. 249, (as G. c-argenteum.)
1841. Larva, chrysalis. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 222.
1852. Larva, chrysalis. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 242.
1856. Larva, chrysalis. *Fitch.* 3d Rept. Ins. N. York, p. 430.
1862. Chrysalis. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 301.
1869. Larva, (brief.) *Harris.* Entom. Corres., p. 280.
1871. Larva, chrysalis. *Le Baron.* 2d Illinois Rept., p. 59.
1871. Egg. *Scudder.* Rept. Peabody Acad. Sc., p. 34.
1871. Larva, (brief.) *Saunders.* Rept. Entom. Soc. Ontario, p. 376.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill, vol. 18, Append., p. 85
1880. Life history. *W. H. Edwards.* Canad. Entom., vol. 12, p. 9.
1881. Larva. *Packard,* (quotes Fitch.) Ins. Inj. Forest Trees, p. 66.
1883. Larva, chrysalis. *Saunders.* Ins. Inj. Fruits, p. 347.
1884. Egg, larva, chrysalis. *Fernald.* Butt. Maine, p. 54.
1886. Life history. *French.* Butt. East. U. States, p. 191.
FOOD PLANT. *Ribes* of various species.

Grapta j. album. Bois.-Lec.

1864. Larva, chrysalis. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 58.
1884. Larva, chrysalis. *Fernald.* Butt. Maine, p. 55.
1886. Larva, chrysalis. *French.* Butt. East. U. States, p. 193.

Vanessa antiopa. F.

1828. Larva, chrys., (brief.) *Stephens.* Ill. Brit. Entom., Haust., vol. 1, p. 45.
1840. Larva, chrys. *P. H. Gosse.* Canad. Naturalist, p. 294.
1841. Larva, chrys. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 219.
1842. Larva, (brief.) *Duncan.* Natural. Library, vol. 6, p. 169.
1852. Larva, chrys. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 238.



1881. Egg, (fig.) *Scudder.* Butt., their structure, etc., p. 98.
1881. Larva, chrysalis, (fig.) *Scudder.* Loc. cit., p. 37.
1881. Larva, (brief.) *Packard* Ins. Inj. Forest Trees, p. 64.
1882. Larva, chrysalis. *W. F. Kirby.* Europ. Butt. and Moths, p. 12.
1884. Egg, (fig.) *Fernald.* Butt. Maine, p. 56.
1884. Larva, chrysalis. *Fernald.* Loc. cit, p. 56.
1885. Egg, larva. *Hy. Edwards.* Kingsley's Stand. N. Hist., vol. 2, p. 487.
1886. Egg, (fig.) *French.* Butt. East. U. States, p. 194.
1886. Larva, chrysalis. *French.* Loc. cit., p. 194.
FOOD PLANT. *Salix.*

Vanessa californica. Bois.
1863. Larva, (brief) *Behr.* Proc. Cal. Acad. Sc., vol. 3, p. 123.
1875. Larva, chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 123.
FOOD PLANT. *Ceanothus thyrsiflorus.*

Vanessa milbertii. Godt.
1840. Larva. *P. H. Gosse.* Canad. Naturalist, pp. 107, 221.
1862. Larva, chrysalis. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 303.
1863. Larva. *Saunders.* Proc. Entom. Soc. Philad., vol. 2, p. 28.
1864. Larva, chrysalis. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 61.
1869. Larva. *Saunders.* Canad. Entom., vol. 1, p. 76.
1873. Larva, chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 170.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 85.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 161.
1881. Egg, (fig.) *Scudder.* Butt., their structure, etc., p. 99.
1884. Larva. *Fernald.* Butt. Maine, p. 57.
1885. Life history. *W. H. Edwards.* Canad. Entom., vol. 17, p. 181.
1886. Larva. chrysalis. *French.* Butt. East. U. States, p. 195.
FOOD PLANT. *Urtica.*

Pyrameis atalanta. L.
1828. Larva, chrysalis, (brief.) *Stephens.* Ill. Brit. Entom., Haust., vol. 1, p. 46.
1842. Larva, (brief.) *Duncan.* Natural. Library, Entom., vol. 6, p. 171.
1855. Larva, chrysalis, (col'd fig.) *Westwood.* Brit. Butt., p. 53, pl. 8.
1856. Larva, chrysalis. *Chenu—Lucas.* Encyc. Nat. Hist. Papillons, vol. 1, p. 103.
1857. Larva. *Stainton.* Man. Brit. Butt., vol. 1, p. 38.
1859. Larva, chrysalis. *Edw. Newman.* Butt. Young England, p. 10.
1862. Larva, chrysalis, (fig.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 294.
1862. Larva, chrysalis. *Morris.* Synop. Lep. N. Amer., p. 59.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 203.
1869. Larva. *Harris.* Entom. Corres., p. 279.
1873. Larva. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 169.
1878. Larva. *Birch.* Entom. Month. Mag., vol. 13, p. 209.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 86.
1881. Egg, (fig.) *Scudder.* Butt., their structure, etc., p. 8.
1881. Nest, (fig.) *Scudder.* Loc. cit., p. 109.
1882. Larva, chrysalis. *W. F. Kirby.* Europ. Butt. and Moths, p. 11.
1882. Life history. *W. H. Edwards.* Canad. Entom., vol. 14, p. 229.
1883. Life history, (cont'd.) *W. H. Edwards.* Loc. cit., vol. 15, p. 14.
1884. Egg, (fig.) *Fernald.* Butt. Maine, p. 58.
1884. Larva. *Fernald.* Loc. cit., p. 58.
1886. Life history. (condensed.) *French.* Butt. East. U. States, p. 197.
1886. Egg, (fig.) *French.* Loc. cit.
FOOD PLANTS. *Humulus, Bahmeria, Urtica.*

Pyrameis huntera. F.
1797. Larva. *Abbot—Smith.* Lep. Ins. Georgia.
1833. Larva, chrysalis, (col'd fig.) *Bois.-Lec.* Hist. Lep. N. Amer., p. 180, pl. 48.

1862. Larva, chrysalis. *Morris*, (quotes Bois. and Lec.) Synop. Lep. N. Amer., p. 60.
1862. Larva, chrysalis. *Harris*. Ins. Inj. Vegetat., Flint's edit., p. 293.
1864. Larva, chrysalis. *Lintner*. Proc. Entom. Soc. Philad., vol. 3, p. 63.
1869. Larva. *Saunders*. Canad. Entom., vol. 1, p. 105.
1873. Larva. *Hy. Edwards*. Proc. Cal. Acad. Sc., vol. 5, p. 170.
1873. Chrysalis. *Hy. Edwards*, (quotes Bois.) Loc. cit., vol. 5, p. 170.
1880. Larva. *Miss Middleton*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 86.
1880. Larva. *Coquillett*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 153.
1884. Larva. *Fernald*. Butt. Maine, p. 58.
1886. Larva, chrysalis. *French*. Butt. East. U. States, p. 198.

FOOD PLANTS. *Gnaphalium, Antennaria.*

Pyrameis cardui. L.

1828. Larva, chrysalis, (brief.) *Stephens*. Illust. Brit. Entom., Haust., vol. 1, p. 47.
1842. Larva, chrysalis, (brief.) *Duncan*. Natural. Library, Entom., vol. 6, p. 176.
1854. Larva, chrysalis, (col'd figs.) *Emmons*. Nat. Hist. N. York., vol. 5, pl. 46.
1855. Larva, chrysalis, (col'd figs.) *Westwood*. Brit. Butt., p. 55, pl. 8.
1856. Larva, chrysalis. *Chenu—Lucas*. Encyc. Nat. Hist. Papillons, vol. 1, p. 104.
1857. Larva. *Stainton*. Man. Brit. Butt., p. 37.
1859. Larva, chrysalis. *Edw. Newman*. Butt. Young England, p. 10.
1862. Larva, chrysalis. *Harris*. Ins. Inj. Vegetat., Flint's edit., p. 292.
1862. Larva, chrysalis. *Morris*. Synop. Lep. N. Amer., p. 60.
1864. Larva. *Jaeger*. Life N. Amer. Insects, p. 204.
1869. Larva. *Saunders*. Canad. Entom., vol. 1, p. 93.
1869. Larva, chrysalis, (figs.) *Harris*. Entom. Corres., p. 277, pl. 1.
1873. Larva. *Hy. Edwards*, (quotes Stainton.) Proc. Cal. Acad. Sc., vol. 5, p. 170.
1876. Larva. *Scudder*. Amer. Naturalist, vol. 10, pp. 392, 602.
1880. Larva. *Miss Middleton*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 87.
1880. Larva. *Coquillett*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 153.
1881. Larva, (brief.) *Gundlach*. Entom. Cubana, p. 40.
1882. Larva, chrys. *W. F. Kirby*. Europ. Butt. and Moths, p. 13.
1884. Larva. *Fernald*. Butt. Maine, p. 59.
1886. Larva. *French*. Butt. East. U. States, p. 200.

FOOD PLANTS. *Cnicus, Carduus, Althæa, Urtica.*

Pyrameis caryæ. Hübn.

1863. Larva, (brief.) *Behr*. Proc. Cal. Acad. Sc., vol. 3, p. 125.
1874. Larval stages, chrysalis. *Hy. Edwards*. Loc. cit., vol. 5, p. 329.

1869. Larva, chrysalis, (fig.) *Harris.* Entom. Corres., p. 276, pl. 4.
1871. Larva. *Riley.* Canad. Entom., vol. 3, p. 52.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 154.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 87.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 162.
1881. Larva stages. *W. H. Edwards.* Canad. Entom., vol. 13, p. 242.
1883. Larva, chrysalis, (brief.) *Saunders.* Ins. Inj. Fruits, p. 218.
1886. Larva, (brief.) *French.* Butt. East. U. States, p. 207.
FOOD PLANTS. *Vaccinium, Cerasus, Ribes, Quercus, Salix, etc.*

Limenitis arthemis. Drury, (incl. vars.)
1840. Larva, chrys. (figs.) *P. H. Gosse.* Canad. Naturalist, pp. 220, 221.
1864. Larva, chrysalis. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 62.
1875. Larva. *T. L. Mead.* Canad. Entom., vol. 7, p. 163, (var. proserpina.)
1875. Life history. *T. L. Mead.* Canad. Entom., vol. 7, p. 162.
1877. Larva. *Scudder.* Psyche, vol. 1, p. 14.
1879. Life history. *W. H. Edwards.* Canad. Entom., vol. 11, p. 224.
1879. Life history. *W. H. Edwards.* Canad. Entom., vol. 11, p. 224, (var. proserpina.)
1879. Life history, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Limenitis, No. 1.
1881. Nest, (fig.) *Scudder.* Butt., their structure, etc., p. 113.
1884. Egg, larva, chrysalis. *Fernald.* Butt. Maine, p. 62.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 208.
FOOD PLANTS. *Crataegus, Salix.*

Limenitis disippus. Godt.
1833. Larva, chrysalis, (col'd figs.) *Bois.-Lec.* Hist. Lep. N. Amer., p. 204, pl. 55.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 379.
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 66.
1862. Larva, chrysalis. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 282.
1864. Larva, chrysalis. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 63.
1869. Larva. *Saunders.* Canad. Entom., vol. 1, p. 94.
1869. Larva, chrysalis. Amer. Entom., vol. 1, p. 193.
1871. Larva. *Riley.* Canad. Entom., vol. 3, p. 52.
1871. Egg, (figs.) *Riley.* 3d Missouri Rept., p. 153.
1871. Larva, chrysalis, (figs.) *Riley.* Loc. cit., pp. 153–157.
1874. Life history, (figs.) *Saunders.* Canad. Entom., vol. 6, p. 46.
1874. Larva, chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 330.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 154.
1879. Life history. *W. H. Edwards.* Canad. Entom., vol. 11, p. 224.
1881. Nest, (fig.) *Scudder,* (quotes Riley.) Butt., their structure, etc., p. 112.
1881. Egg, (fig.) *Scudder,* (quotes Riley.) Loc. cit., p. 10.
1881. Larva, chrysalis, (figs.) *Scudder,* (quotes Riley.) Butt., their structure, etc., pp. 22, 45.
1883. Egg, larva, chrysalis, (figs.) *Saunders.* Ins. Inj. Fruits, pp. 169, 170.
1884. Egg, larva, chrysalis, (figs.) *Fernald.* Butt. Maine, pp. 63, 64.
1886. Egg, larva, chrysalis, (figs.) *French.* Butt. East. U. States, p. 211.
1886. Life history, (condensed.) *French.* Loc. cit., p. 211.
FOOD PLANTS. *Salix, Populus, etc.*

Limenitis eros. Edw.
1880. Larval stages, chrysalis. *W. H. Edwards.* Canad. Entom., vol. 12, p. 246.
1883. Life history, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Limenitis, No. 2.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 214.

Limenitis lorquini. *Bois.*

1873. Larva, (brief.) *W. H. Edwards*, (quotes Behr. in lit.) Butt. N. Am. E., pl. Limenitis, No. 3.

1873. Chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 171.

1874. Larva. *Hy. Edwards.* Loc. cit., vol. 5, p. 330.

FOOD PLANT. *Quercus.*

Heterochroa californica. Butler.

1873. Chrysalis. *Hy. Edwards.* Proc. Cal. Acad. Sc., vol. 5, p. 171.

1877. Larva, chrysalis. *Hy. Edwards.* Loc. cit.

FOOD PLANT. *Quercus.*

Apatura clyton. Bois.–Lec., (includ. vars.)

1833. Larva, chrysalis, (col'd figs.) *Bois.–Lec.* Hist. Lep. N. Amer., p. 208, pl. 56.

1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 380.

1862. Larva, chrysalis. *Morris*, (quotes Bois.–Lec.) Synop. Lep. N. Amer., p. 68.

1874. Egg, larva, (figs.) *Riley.* 6th Missouri Rept., pp. 140–150, (as A. Herse.)

1876. Life history, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Apatura, No. 2.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 155.

1880. Egg, chrysalis, (figs.) *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 89.

1881. Egg, larva, chrys., (figs.) *Scudder*, (after Riley.) Butt., their structure, etc., p. 262.

1881. Larva, chrys. *Gundlach.* Entom. Cubana, p. 63, (as Doxocopa Idyja. Hbn.)

1886. Egg, larva, chrys., (figs.) *French*, (after Riley.) Butt. East. U. States, p. 219.

1886. Life history, (condensed.) *French.* Loc. cit., p. 219.

FOOD PLANT. *Celtis occidentalis.*

Apatura flora. Edw.

1881. Life history. *W. H. Edwards.* Canad. Entom., vol. 13, p. 81.

1886. Life history, (condensed.) *French*, (quotes W. H. Edwards.) Butt. East. U. States, p. 222.

Apatura celtis. Bois.–Lec.

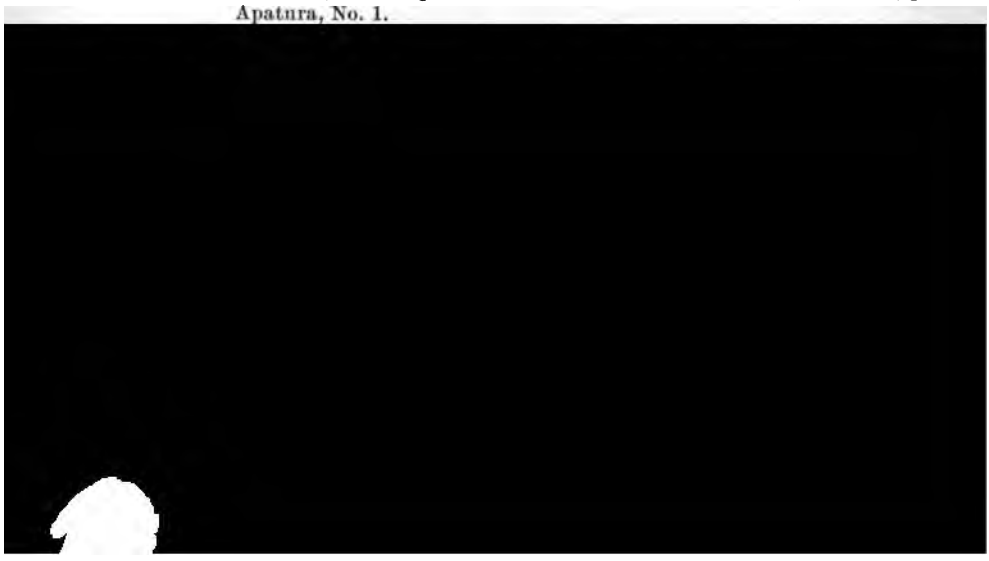
1833. Larva, chrysalis, (col'd figs.) *Bois.–Lec.* Hist. Lep. N. Amer., p. 210, pl. 57.

1862. Larva, chrysalis. *Morris*, (quotes Bois.–Lec.) Synop. Lep. N. Amer., p. 69.

1874. Egg, (fig.) *Riley*, (as A. lycaon.) 6th Missouri Rept., pp. 137–150.

1874. Larva, chrysalis, (figs.) *Riley.* Loc. cit., pp. 137–150.

1875. Life history, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Apatura, No. 1.



1888. Life history. *W. H. Edwards.* Canad. Entom., vol. 20, p. 41.
FOOD PLANT. *Croton capitatum.*

Debis portlandia. Fab.

1825. Larva. *Say.* N. Amer. Entomology, vol. 2.
1833. Larva, chrysalis, (col'd fig.) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 226, pl. 58.
1862. Larva, chrysalis, (brief.) *Morris,* (quotes Say.) Synop. Lep. N. Amer., p. 79, (as D. andromacha.)
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Loc. cit., p. 79.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 92.
1882. Life history. *W. H. Edwards.* Canad. Entom., vol. 14, p. 84.
1884. Egg, larva, chrysalis. *Fernald.* Butt. Maine, p. 71.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 230.

Neonympha canthus. Bois.-Lec.

1883. Egg, larval stages. *W. H. Edwards.* Canad. Entom., vol. 15, p. 64.
1884. Egg, larva. *Fernald.* Butt. Maine, p. 68.
1885. Chrysalis. *W. H. Edwards.* Canad. Entom., vol. 17, p. 112.
1886. Life history, (brief.) *French.* Butt. East. U. States, p. 232.

Neonympha gemma. Hübn.

1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 62.
1879. Life history, (figs.) *W. H. Edwards.* Canad. Entom., vol. 11, p. 31.
1880. Larva, chrysalis. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 91.
1881. Life history, (condensed.) *French.* Butt. East. U. States, p. 235.

Neonympha areolatus. Abb.-Sm.

1797. Larva. *Abbot—Smith.* Lep. Ins. Georgia, vol. 1, pl. 13.
1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 63.
1882. Life history. *W. H. Edwards.* Canad. Entom., vol. 14, p. 163.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 237.

Neonympha eurytris. Fab.

1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 61.
1870. Egg, larval stages. *Saunders.* Canad. Entom., vol. 2, p. 139.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 156.
1878. Life history. *W. H. Edwards.* Canad. Entom., vol. 10, p. 125.
1880. Egg, larva, chrysalis. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 90.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 184.
1884. Larval stages, chrysalis. *Fernald.* Butt. Maine, p. 67.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 238.

Neonympha sosybius. Fab.

1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 63.
1877. Life history. *W. H. Edwards.* Canad. Entom., vol. 9, p. 229.
1880. Egg, larva, chrysalis. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 91.
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 241.

Cœnomympha ampelos. Edw.

1887. Life history. *W. H. Edwards.* Canad. Entom., vol. 19, p. 42.

Satyrus alope. Fab., (includ. vars.)

1833. Larva, chrysalis. *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 228, pl. 59.
1854. Larva, chrysalis, (col'd figs.) *Emmons.* N. Hist. N. York, Entom., vol. 5, pl. 33.

1877. Life history. *W. H. Edwards.* Canad. Entom , vol. 9, p. 141, (var. nephele.)
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 17, p. 156.
1880. Life history. *W. H. Edwards.* Canad. Entom., vol. 12, pp. 21, 51, 90, 109.
1880. Larva, chrysalis. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 92.
1880. Egg, larva. *Miss Middleton.* Loc. cit., p. 92, (var. nephele.)
1880. Larva. *Coquillett.* Loc. cit., p. 180, (var. nephele.)
1881. Young larva, chrysalis, (figs.) *Scudder.* Butt., their structure, etc., pp. 29–43.
1882. Life history, (col'd fig.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Satyrus, 2–3, (incl. vars. nephele–olympus.)
1884. Egg, larva, chrysalis, (figs.) *Fernald.* Butt. Maine, p. 74.
1886. Chrysalis, (fig.) *French.* Butt. East. U. States, p. 246.
1886. Life history, (condensed.) *French.* Loc. cit., p. 246.

Satyrus charon. Edw.

1875. Egg. *T. L. Mead.* Rept. Lepid. Wheeler Exped., vol. 5, p. 773.
1886. Life history. *W. H. Edwards.* Canad. Entom., vol. 18, p. 88.

Chionobas iduna. Edw.

1879. Egg. *W. H. Edwards.* Canad. Entom., vol. 11, p. 143.
1879. Egg, (col'd fig.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Chionobas, No. 3.

Chionobas chryxus. West.-Hew.

1875. Egg. *T. L. Mead.* Rept. Lepid. Wheeler Exped., vol. 5, p. 777.

Chionobas ivallda. Mead.

1879. Egg, young larva. *W. H. Edwards.* Canad. Entom., vol. 11, p. 142.
1879. Egg, young larva, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Chionobas, No. 3.

Chionobas semidea. Say.

1863. Egg, larva, chrysalis. *Scudder.* Charact. Insect Fauna, White Mountains, pp. 623, 625.
1874. Larva, chrysalis, (figs.) *Scudder.* Geology N. Hampshire, pl. A.

Chionobas jutta. Hübn.

Egg, larva, (fig'd.) *Holmgren.* Entom. Tidsch., vol. 7, p. 151.
1888. Life history. *T. W. Fyles.* Canad. Entom., vol. 20, p. 131.
1889. Larva, notes on. *T. W. Fyles.* Canad. Entom., vol. 21, p. 12.

Chionobas macounii. Edw.

1888. Egg, larva. *J. Fletcher.* A Trip to Nepigon, p. 12.

NOTE.—It is believed that the larvæ of the Satyrinæ feed exclusively on various

Feniseca tarquinius. Fab.

1833. Larva, chrysalis, (figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 128, pl. 37.
1886. Life history. *W. H. Edwards.* Canad. Entom., vol. 18, pp. 141–148.
1888. Egg, chrysalis, (brief.) *S. H. Scudder.* Psyche, vol. 5, p. 70.

Feeds on Aphides. So far, the only carniverous lepidopterous larva known in our fauna.

Thecla halesus. Cr.

1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 83, pl. 25.
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 92.
1886. Larva, chrysalis, (brief.) *French,* (quotes Morris.) Butt. East. U. States, p. 256.
1888. Chrysalis. *Hy. Edwards.* Entom. Amer., vol. 3, p. 162.

FOOD PLANT. *Quercus.*

Thecla m. album. Bois.-Lec.

1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 88, pl. 27, (as T. psyche.)
1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 86, pl. 26.
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 93.
1880. Larva, chrysalis. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 92.
1886. Larva, chrysalis, (brief.) *French.* Butt. East. U. States, p. 256.

FOOD PLANTS. *Quercus, Astragalus.*

Thecla favonius. Abb.-Sm.

1797. Larva, chrysalis, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, vol. 1, pl. 14.
1886. Larva, chrysalis, (brief.) *French,* (quotes Abb.-Sm.) Butt. East. U. States, p. 258.

FOOD PLANT. *Quercus.*

Thecla humuli. Harr.

1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 90, pl. 28, (as T. hyperici.)
1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 99, pl. 31, (as T. liparops.)
1852. Larva, (brief.) *Harris.* Ins. Inj. Veget., 2d edit., p. 235.
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., pp. 96, 97, (as T. liparops.)
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 94, (as T. hyperici.)
1862. Larva, chrysalis. *Harris.* Ins. Inj. Veget., Flint's edit., p. 276.
1877. Larva. *Packard,* (quotes Harris.) Inj. Ins. West, Hayden's Rept., p. 773.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 92.

FOOD PLANT. *Humulus.*

Thecla acadica. Edw.

1868. Larva. *Saunders.* Canad. Entom., vol. 1, p. 95.
1869. Larva, (col'd fig.) *W. H. Edwards.* Butt. N. Amer., 1st series, pl. Thecla, No. 1.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 93.
1886. Larva. *French,* (quotes Saunders.) Butt. East. U. States, p. 261.

FOOD PLANT. *Salix.*

Thecla calanus. Hübn.

1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 92, pl. 29, (as T. falacer.)

1862. Larva, chrysalis. *Morris*, (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 95.
1869. Egg. *Saunders*. Canad. Entom., vol. 1, p. 57.
1869. Larva, (?). *Saunders*. Canad. Entom., vol. 1, p. 98.
1870. Larva. *Saunders*. Canad. Entom., vol. 2, p. 61, (as T. inorata.)
1880. Larva, (?) *Miss Middleton*, (quotes Saunders.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 93.
1881. Larva. *Packard*. Ins. Inj. Forest Trees, p. 8[illegible].
1886. Larva, chrysalis. *French*, (quotes Saunders.) Butt. East. U. States, p. 264.

FOOD PLANT. *Quercus*.

Thecla strigosa. Harris.

1868. Larva. *Saunders*. Canad. Entom., vol. 1, p. 99.
1869. Larva, chrysalis. *W. H. Edwards*, (quotes Saunders.) Butt. N. Amer., 1st series, pl. Thecla, No. 2.
1880. Larva. *Miss Middleton*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 92.
1883. Larva, chrysalis. *Saunders*. Ins. Inj. Fruits, p. 176.
1884. Larva. *Fernald*, (quotes Saunders.) Butt. Maine, p. 78.
1886. Larva, chrysalis. *French*, (quotes Saunders.) Butt. East. U. States, p. 267.

FOOD PLANT. *Quercus, etc.*

Thecla smilacis. Bois.-Lec.

1883. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte*. Hist. Lep. N. Amer., p. 107, pl. 33.
1862. Larva, chrysalis. *Morris*, (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 99.
1880. Larva, chrysalis. *Miss Middleton*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 93.
1884. Larva, chrysalis, (brief.) *Saunders*. Canad. Entom., vol. 16, p. 52.
1886. Larva, chrysalis, (brief.) *French*. Butt. East. U. States, p. 268.

FOOD PLANT. *Smilax rotundifolia*.

Thecla poeas. Hübn.

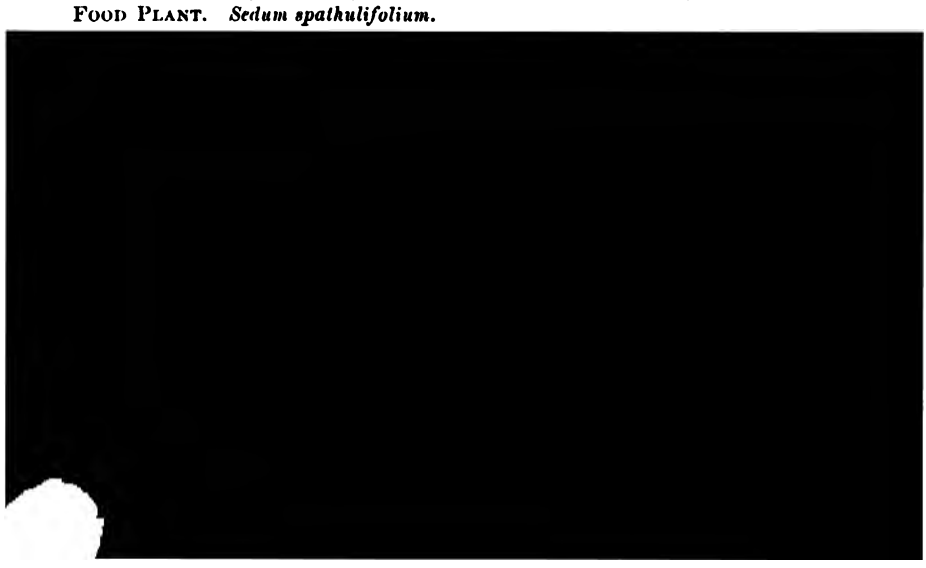
1880. Larva, (brief.) *Riley*. Amer. Entom., vol. 1, 2d series, p. 201.
1880. Larva, (brief.) *Miss Middleton*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 93.

FOOD PLANT. *Gossypium*.

Thecla irioides. Bois.

1878. Larva, chrysalis. *Hy. Edwards*. Proc. Cal. Acad. Sc., June.

FOOD PLANT. *Sedum spathulifolium*.



Thecla niphon. Hübn.

1833. Larva, chrysalis. *Boisduval—Leconte.* Hist. Lep. N. Amer., p. 105, pl. 33.
1858. Larva, chrysalis. *Fitch.* 4th Rept. N. Y. Agr. Soc., pp. 57, 743.
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 98.
1868. Larva. *Saunders.* Canad. Entom., vol. 1, p. 96.
1880. Larva, chrysalis. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 94.
1881. Larva. *Packard,* (quotes Fitch.) Ins. Inj. Forest Trees, p. 201.
1884. Larva, chrysalis. *Fernald.* Butt. Maine, p. 83.
1884. Egg. *Fletcher.* Canad. Entom., vol, 16, p. 92.
1886. Larva, chrysalis, (brief.) *French.* Butt. East. U. States, p. 276.
FOOD PLANT. *Pinus.*

Thecla titus. Fab.

1833. Larva, chrysalis. *Boisduval-Leconte.* Hist. Lep. N. Amer., p. 109, pl. 34.
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 102.
1868. Larva. *Saunders.* Canad. Entom., vol. 1, p. 96.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 94.
1883. Larva, chrysalis. *Saunders.* Ins. Inj. Fruits, p. 219.
1884. Larva, chrysalis. *Fernald.* Butt. Maine, p. 84.
1886. Larva, chrysalis, (brief.) *French.* Butt. East. U. States, p. 278.
FOOD PLANT. *Quercus.*

Chrysophanus thoe. Bois.-Lec.

1868. Egg. *Saunders.* Canad. Entom., vol. 1, p. 57.
1880. Egg. *Miss Middleton,* (quotes Saunders.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 95.
1881. Egg, (fig.) *Scudder.* Butt., their structure, etc., p. 8.
1886. Egg. *French,* (quotes Saunders.) Butt. East. U. States, p. 281.
FOOD PLANT. *Polygonum.*

Chrysophanus xanthoides. Bois.

1887. Egg. *Hy. Edwards.* Entom. Amer., vol. 3, p. 162.

Chrysophanus helloides. Bois.

1875. Larva, chrysalis. *T. L. Mead.* Rept. Lep. Wheeler Expd., vol. 5, p. 780.

Chrysophanus epixanthe. Bois.-Lec.

1868. Egg. *Saunders.* Canad. Entom., vol. 1, p. 57.
1886. Egg. *French,* (quotes Saunders.) Butt. East. U. States, p. 282.

Chrysophanus hypophleas. Bois.

1840. Egg. *P. H. Gosse.* Canad. Naturalist, p. 221.
1862. Larva, (brief.) *Packard.* 2d Rept. Nat. Hist. Geol. Maine, p. 166.
1862. Larva, chrysalis. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 274.
1868. Larva. *Saunders.* Canad. Entom., vol. 1, p. 4.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 95.
1881. Egg, larva, chrysalis, (figs.) *Scudder.* Butt., their structure, etc., pp. 7, 20, 31, 43.
1884. Larva, chrysalis, (figs.) *Fernald.* Butt. Maine, p. 88.
1885. Larva. *Hy. Edwards.* Kingsley's Stand. Nat. Hist., vol. 2, p. 476.
1886 Egg, larva, chrysalis, (figs.) *French,* (quotes Saunders and Scudder.) Butt. East. U. States, p. 283.
FOOD PLANT. *Rumex acetosella.*

Lycæna lycea. Edw.

1875. Larva, (brief.) *T. L. Mead.* Rept. Lep. Wheeler Expd., vol. 5, p. 785.

Lycæna pembina. Edw.

1868. Larva. *Saunders.* Canad. Entom., vol. 1, p. 12.

Lycæna melissa. Edw.

1884. Life history. *W. H. Edwards.* Papilio, vol. 4, p. 91.
FOOD PLANT. *Astragalus.*

Lycæna scudderi. Edw.

1878. Larva. *Saunders.* Canad. Entom., vol. 10, p. 14.
1880. Larva. *Miss Middleton,* (quotes Saunders.) Trans. Dept. Agr. Ill, vol. 18, Append., p. 95.
FOOD PLANT. *Lupinus perennis.*

Lycæna acmon. Doubl.-Hew.

1875. Larva. *Hy. Edwards.* Proc. Cal. Acad. Sc., April, (as L. antægon.)
FOOD PLANT. *Hosackia.*

Lycæna pseudargiolus. Bois.-Lec., (includ. vars.)

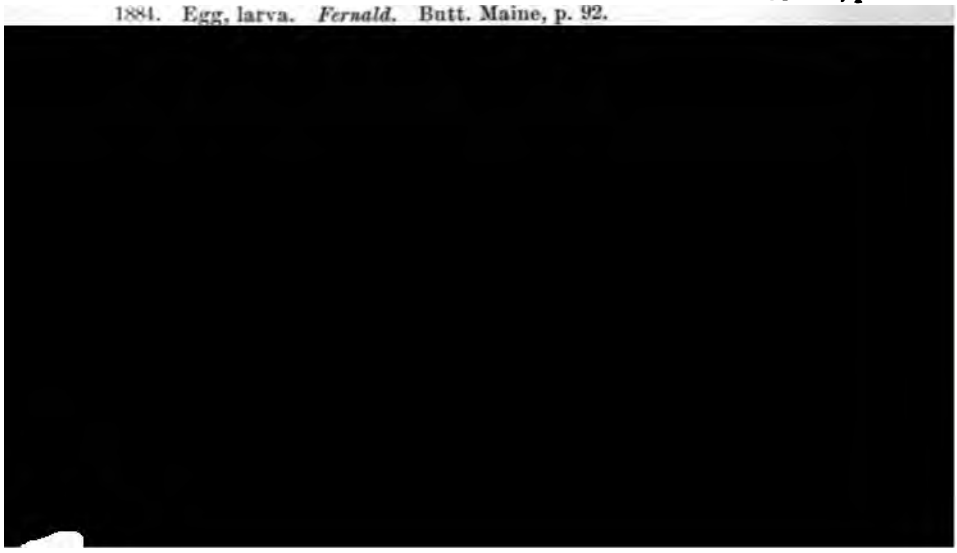
1797. Larva, chrys. *Abbot—Smith.* Lep. Ins. Georgia.
1833. Larva, chrysalis. *Boisdural—Leconte.* Hist. Lep. N. Amer., p. 118.
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 82.
1868. Larva. *Saunders.* Canad. Entom., vol. 1, p. 100, (as L. neglecta.)
1869. Larva, (col'd fig.) *W. H. Edwards,* (quotes Abb.-Sm., Bois.-Lec.) Butt. N. Amer., 1st series, pl. Lycæna, No. 2.
1873. Egg, larval stages. *W. H. Edwards.* Canad. Entom., vol. 5, p. 224.
1875. Egg, larva. *W. H. Edwards.* Canad. Entom., vol. 7, p. 81.
1878. Life history. *W. H. Edwards.* Canad. Entom., vol. 10, p. 12.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 95.
1880. Larva. *Miss Middleton.* Loc. cit., p. 96, (as L. neglecta.)
1883. Life history. *W. H. Edwards.* Papilio, vol. 3, pp. 85–97.
1884. Life history, (col'd figs.) *W. H. Edwards.* Butt. N. Amer., 2d series, pl. Lycæna, No. 2.
1884. Larva, chrysalis. *Fernald.* Butt. Maine, p. 89, (as L. neglecta.)
1886. Life history, (condensed.) *French.* Butt. East. U. States, p. 289.
FOOD PLANTS. *Actinomeris, Cornus, etc.*

Lycæna amyntula. Bois.

1884. Life history. *W. G. Wright.* Papilio, vol. 4, p. 126.
FOOD PLANT. *Astragalus.*

Lycæna comyntas. Godt.

1833. Larva, chrysalis, (col'd figs.) *Boisdural—Leconte.* Hist. Lep. N. Amer., p. 120, pl. 36.
1862. Larva, chrysalis. *Morris,* (quotes Bois.-Lec.) Synop. Lep. N. Amer., p. 83.
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 275.
1869. Larva, chrysalis. *Harris.* Entom. corres., p. 275.
1876. Life history. *W. H. Edwards.* Canad. Entom., vol. 8, p. 202.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 95.
1884. Egg, larva. *Fernald.* Butt. Maine, p. 92.



Pamphila phylæus. Drury.

1879. Larva, chrysalis. *A. W. Chapman.* Canad. Entom., vol. 11, p. 190.
1880. Larva. *Miss Middleton,* (quotes Chapman.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 96.
1880. Larva. *Coquillett,* (quotes Chapman.) Loc. cit., p. 176.
1886. Larva, chrysalis. *French,* (quotes Chapman.) Butt. East. U. States, p. 314.

FOOD PLANT. *Grasses.*

Pamphila brettus. Bois.-Lec.

1881. Larva, chrysalis. *Gundlach.* Entom. Cubana, p. 164.
1886. Egg, larva, chrysalis. *French.* Butt. East. U. States, p. 315.

FOOD PLANT. *Grasses.*

Pamphila otho. Bois.-Lec.

1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 17.

Pamphila mystic. Scud.

1869. **Egg,** larval stages. *Saunders.* Canad. Entom., vol. 1, p. 65.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 97.
1884. Egg, larva. *Fernald.* Butt. Maine, p. 99.
1886. Egg, larva. *French.* Butt. East. U. States, p. 319.

FOOD PLANT. *Grasses.*

Pamphila sassacus. Harris.

1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 97.

Pamphila cernes. Bois.-Lec.

1888. Egg, larva. *J. Fletcher.* A Trip to Nepigon, p. 14.

Pamphila peckius. Kby.

1868. Egg, young larva. *Saunders.* Canad. Entom., vol. 1, p. 66.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 178.
1884. Egg, larva. *Fernald.* Butt. Maine, p. 98.
1886. Egg, larva. *Fernald.* Butt. East. U. States, p. 318.

FOOD PLANT. *Grasses.*

Pamphila accius. Abb.-Smith.

1879. Larva. *A. W. Chapman.* Canad. Entom., vol. 11, p. 91.
1881. Chrysalis, (fig.) *Scudder.* Butt., their structure, etc., p. 42.

Pamphila maculata. Edw.

1879. Larva. *A. W. Chapman.* Canad. Entom., vol. 11, p. 191.
1880. Larva. *Coquillett,* (quotes Chapman.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 176.
1886. Larva, chrysalis. *French.* Butt. East. U. States., p. 330.

Pamphila ethlius. Cram.

1877. Larva. *C. R. Dodge.* Field and Forest, vol. 3, p. 73.
1881. Larva, chrysalis. *Gundlach.* Entom. Cubana, p. 160.
1887. Chrysalis. *Hy. Edwards.* Entom. Amer., vol. 3, p. 163.

Pamphila arpa. Bois.-Lec.

1833. Larva, chrysalis, (figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 68.
1879. Larva, chrysalis. *A. W. Chapman.* Canad. Entom., vol. 11, p. 191.
1886. Larva, chrysalis. *French,* (quotes Chapman.) Butt. East. U. States, p. 339.

FOOD PLANT. *Saw-palmetto.*

Pamphila palatka. Edw.

1833. Larva, chrysalis, (figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 67, (as P. bulenta.)
1879. Larva. *Chapman.* Canad. Entom., vol. 11, p. 192.
1880. Larva. *Coquillett.* (quotes Chapman.) Trans. Dept. Agr. Ill., vol. 18. Append., p. 151.

1886. Larva. *French*, (quotes Chapman.) Butt. East. U. States, p. 341.
FOOD PLANT. *Grasses.*

Pamphila delaware. Edw.

1879. Larva, chrysalis. *A. W. Chapman.* Canad. Entom., vol. 11, p. 193
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., 96.
1880. Larva. *Coquillett*, (quotes Chapman.) Loc. cit., p. 174.
1886. Larva. *French*, (quotes Chapman.) Butt. East. U. States, p. 343.
FOOD PLANT. *Grasses.*

Amblyscirtes vialis. Edw.

1888. Egg, larva. *J. Fletcher.* A Trip to Nepigon, p. 15.

Nisoniades brizo. Bois.-Lec.

1833. Larva, chrysalis, (figs.) *Boisduval—Leconte.* Hist. Lep. N. America, pl. 66.

Nisoniades icelus. Lintn.

1869. Egg. *Lintner.* 3d Rept. N. Y. State Cab. N. Hist., p. 163.
1885. Larva, chrysalis. *W. H. Edwards.* Canad. Entom., vol. 17, p. 98.
1886. Egg. *French*, (quotes Lintner.) Butt. East. U. States, p. 355.
1888. Egg. *J. Fletcher.* A Trip to Nepigon, p. 15.
FOOD PLANT. *Populus tremuloides.*

Nisoniades lucilius. Lintn.

1870. Larva. *Lintner.* 24th Rept. N. Y. State Cab. N. Hist., p. 165.
1875. Egg, young larva. *T. L. Mead.* Canad. Entom., vol. 7, p. 163.
1878. Life history. *Lintner.* Entom. Contrib., No. 4, p. 67.
1880. Larva. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 97.
1886. Egg, larva, chrysalis. *French.* Butt. East. U. States, p. 359.
FOOD PLANT. *Aquilegia canadensis.*

Nisoniades persius. Scud.

1881. Nest, (fig.) *Scudder.* Butt., their structure, etc., p. 108.

Nisoniades juvenalis. Fab.

1797. Larva, chrysalis, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, pl. 21.
1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 65.
1862. Larva, chrysalis. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 309.
1880. Larva, chrysalis. *Miss Middleton.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 97.
1881. Larva, chrysalis, (figs.) *Scudder.* Butt., their structure, etc., p. 114, (as Than. ennius.)
1886. Larva, chrysalis, (brief.) *French*, (quotes Harris.) Butt. East. U. States, p. 364.

Eudamus lycidas. Abbot—Smith.

1797. Larva, chrysalis, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, pl. 20.
1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 71.

Eudamus cellus. Bois.-Lec.

1833. Larva, chrysalis. *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 73.

Eudamus tityrus. Fab.

1797. Larva, chrysalis, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, pl. 19
1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 72.
1841. Larva, chrysalis. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 224.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 224.
1854. Larva, chrysalis, (col'd figs.) *Emmons.* Nat. Hist. N. York, pl. 832.
1858. Larva. *Fitch.* 5th Rept. Ins. N. York, § 330.
1859. Larva, nest, chrysalis. *P. H. Gosse.* Letters from Alabama, p. 85.
1862. Larva, chrysalis, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 311.
1862. Larva. *Morris,* (quotes Harris.) Synop. Lep. N. Amer., p. 112.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 163.
1880. Egg, larva. *Miss Middleton.* Loc. cit., vol. 18, Append., p. 98.
1880. Larva. *Coquillett.* Loc. cit., vol. 18, Append., p. 153.
1881. Nest, larva, chrysalis, (figs.) *Scudder.* Butt., their structure, etc., p. 107.
1881. Cocoon, chrysalis, (figs.) *Scudder.* Loc. cit., p. 256.
1881. Larva. *Packard,* (quotes Harris.) Ins. Inj., Forest Trees, p. 100.
1885. Larva. *Hy. Edwards.* Kingsley's Stand. Nat. Hist., vol. 2, p. 475.
1886. Chrysalis, (fig.) *French.* Butt. East. U. States, p. 376.
1886. Life history. *French.* Loc. cit., p. 375.

FOOD PLANTS. *Robinia, Acacia, Wistaria.*

Eudamus proteus. L.

1797. Larva, chrysalis, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, pl. 18.
1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 69.
1856. Larva. *Chenu—Lucas,* (quote Abb.-Sm.) Encyc. Nat. Hist. Papillons, vol. 1, p. 223.
1879. Larva, chrysalis. *A. W. Chapman.* Canad. Entom., vol. 11, p. 193.
1880. Larva, chrysalis. *Coquillett,* (quotes Chapman.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 184.
1881. Larva, chrysalis. *Gundlach.* Entom. Cubana, p. 169.
1886. Larva, chrysalis. *French,* (quotes Chapman.) Butt. East. U. States, p. 378.

FOOD PLANTS. *Phascolus, Clitoria.*

Megathymus yuccæ. Bois.-Lec.

1833. Larva, chrysalis, (col'd figs.) *Boisduval—Leconte.* Hist. Lep. N. Amer., pl. 70, (as Eudamus Yuccæ.)
1876. Larva, chrysalis, (figs.) *Riley.* Trans. Acad. Sc. St. Louis, pp. 323–344.
1876. Life history, (figs.) *Riley.* 8th Missouri Rept., pp. 168–183.
1877. Life history, (figs.) *Riley.* 9th Missouri Rept., p. 129.
1886. Life history, (figs.) *French,* (quotes Riley.) Butt. East. U. States, p. 383.

FOOD PLANT. *Stems of Yucca.*

Megathymus cofaqui. Strecker.

1876. Larva. *Strecker.* Proc. Acad. Nat. Sc. Philad., p. 148.

HETEROCERA.

SPHINGIDÆ.

Hemaris tenuis. Grote.

1877. Larva. *Grote.* Psyche, vol. 2, p. 66.
1880. Larva. *Coquillett,* (quotes Grote.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 160.

1883. Larva. *Ph. Fischer.* Canad. Entom., vol. 15, p. 238.
1884. Egg, larva. *Ph. Fischer.* Canad. Entom., vol. 16, p. 143.
1886. Larva, pupa. *W. J. Holland.* Canad. Entom., vol. 18, p. 101.
FOOD PLANT. *Symphoricarpus racemosus.*

Hemaris marginalis. Grote.
Life history. *H. S. Jewett.* Bull. Brooklyn Entom. Soc., vol. 4, p. 17.
FOOD PLANT. *Lonicera sempervirens.*

Hemaris diffinis. Bois.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 85, pl. 43
1839. Larva. *Harris.* Silliman's Jour. Sc. Art., vol. 36, p. 308.
1859. Larva. *Clemens.* Journal Acad. N. Sc. Philad., (July.)
1862. Larva, (brief.) *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 149.
1870. Larva. *T. L. Mead.* Canad. Entom., vol. 2, p. 157.
1870. Larva. *Lintner.* 24th Rept. N. Y. State Cab. N. Hist., p. 110.
1874. Larva. *Boisduval.* Spec. Gener. Sphingidæ, p. 367.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 160.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 99.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 50.
1886. Larva. *Fernald.* Sphingidæ N. Engl'd, p. 15.
FOOD PLANTS. *Apocynum, Symphoricarpus.*

Hemaris thysbe. Fab., (includ. vars.)
1864. Larva, pupa. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 646.
1874. Larva. *Boisduval.* Spec. Gener. Sphingidæ, p. 370.
1879. Larva, pupa. *G. D. Hulst.* Bull. Brooklyn Entom. Soc., vol. 2, p. 38
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 99.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 51.
1883. Larva, pupa. *Edwards—Elliot.* Papilio, vol. 3, p. 125, (as H. uniformis.)
1885. Larva. *Fernald.* Kingsley's Stand. Nat. Hist., vol. 2, p. 465.
1886. Larva. *Fernald.* Sphingidæ N. Engl'd, p. 17.
1888. Larva. *J. B. Smith,* (quotes Lintner-Hulst.) Monog. Sphing., p. 100
FOOD PLANTS. *Viburnum, Crataegus, Prunus, etc.*

Hemaris buffaloensis. G. and R.
1870. Life history. *Lintner.* 24th Rept. N. York State Cab. N. Hist , p. 112.
1888. Larva. *J. B. Smith,* (quotes Lintner.) Monog. Sphing., p. 105.
FOOD PLANT. *Viburnum.*

Hemaris etolus. Bois.
1874. Larva. *Boisduval.* Spec. Gener. Sphingidæ, p. 370.
FOOD PLANT. *Viburnum.*

1882. Larva. *E. B. Reed*, (quotes Andrews.) 12th Rept. Entom. Soc. Ontario.
1882. Larva, brief. *Julia E. Saunders.* Papilio, vol. 2, p. 147.
1886. Larva. *Fernald.* Sphingidæ N. Engl'd, p. 21.
FOOD PLANTS. *Rubiaceæ, Vitis.*

Thyreus abbotii. Swainson.
1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36, p. 307.
1856. Larva, (fig.) *Chenu—Demarets.* Encyc. Hist. Nat. Papillons, vol. 1, p. 257.
1859. Larva, pupa. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva, pupa. *Morris*, (quotes Clemens.) Synop. Lep. N. Amer., p. 156.
1869. Larva. *Harris.* Entom. Corres., p. 284.
1870. Larva, pupa. *Lintner.* 24th Rept. N. York State Cab. N. Hist., p. 111.
1874. Larva, pupa. *Boisduval.* Spec. Gener. Sphingidæ, p. 331, (from Abbot's drawing.)
1876. Larva. *C. P. Whitney.* Canad. Entom., vol. 8, p. 75.
1876. Larva, (brief.) *A. R. Grote.* Canad. Entom., vol. 8, p. 100.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 164.
1878. Larva, (fig.) *G. H. Perkins.* 5th Rept. Vermont Agr. Soc., p. 281.
1878. Larva, (fig.) *Saunders.* Canad. Entom., vol. 10, p. 130.
1879. Life history, (figs.) *Riley.* 2d Missouri Rept., p. 78.
1880. Larva, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 42.
1880. Larva, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 100.
1881. Larva, (fig.) *Saunders.* Canad. Entom., vol. 13, p. 2.
1882. Larva, (fig.) *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 53.
1882. Larva, (brief.) *Julia E. Saunders.* Papilio, vol. 2, p. 147.
1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 253.
1886. Larva, (fig.) *Fernald.* Sphingidæ N. Engl'd, p. 23.
FOOD PLANTS. *Vitis, Ampelopsis.*

Enyo lugubris. L.
1797. Larva, pupa, (fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 59, pl. 30.
1837. Larva, pupa. *Westwood*, (quotes Abb.-Sm.) Drury's Illus. Exot. Entom., vol. 1, p. 56.
1839. Larva. *Harris*, (quotes Abb.-Sm.) Silliman's Jour. Sc. Art, vol. 36, p. 307.
1859. Larva. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva. *Morris*, (quotes Abb.-Sm.) Synop. Lep. N. Amer., p. 162.
1874. Larva. *Boisduval.* Spec. Gener. Sphingidæ, p. 297.
FOOD PLANT. *Ampelopsis hederacea.*

Deidamia inscripta. Harris.
1862. Pupa. *Clemens.* Morris's Synop. Lep. N. Amer., p. 159.
1877. Larva, pupa. *Strecker*, (fide Akhurst.) Rhopal. et Heteroc., p. 112.
1886. Larva, pupa. *Fernald.* Sphingidæ N. Engl'd, p. 70.
FOOD PLANT. *Ampelopsis.*

Deilephila chamænerii. Harris.
1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36, p. 305.
1859. Larva. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva. *Morris*, (quotes Clemens.) Synop. Lep. N. Amer., p. 165.
1864. Larva, pupa. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 661.
1870. Larva, pupa, (brief.) *G. J. Bowles.* Canad. Entom., vol. 3, p. 115.
1874. Larva. *Boisduval*, (as D. galii.) Spec. Gener. Sphingidæ, p. 170.
1876. Larva, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 37.
1877. Larva, (fig.) *Saunders.* Canad. Entom., vol. 9, p. 64.
1880. Larva. *Coquillett*, (quotes Saunders.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 159.
1882. Larva. *E. B. Reed*, (quotes Saunders.) 12th Rept. Entom. Soc. Ontario, p. 54.
1883. Larva, cocoon, pupa. *Saunders.* Ins. Inj. Fruits, p. 257.

1886. Larva. *Fernald.* Sphingidæ N. Engl'd, p. 55.
1888. Larva, (brief.) *J. B. Smith,* (quotes Harris, Clemens, Morris.) **Monog.** Sphing., p. 133.

FOOD PLANT. *Epilobium angustifolium.*

Deilephila lineata. Fabr.

1797. Larva, pupa, (fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 77, pl. 39.
1828. Larva, pupa. *Stephens.* Illus. Brit. Entom., Haust., vol. 1, p. 127.
1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36, p. 304.
1856. Larva, pupa. *Chenu.* Encyc. Hist. Nat. Papillons, p. 262.
1859. Larva, pupa. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1860. Larva. *Duncan.* Natural. Library, vol. 30, p. 152.
1862. Larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 164.
1864. Larva, pupa. *Lintner.* Proc. Entom Soc. Philad., vol. 3, p. 662.
1871. Larva, (fig.) *Riley.* 3d Missouri Rept., p. 141.
1874. Larva, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 28.
1874. Larva. *Boisduval,* (quotes Abbot as D. daucus.) Spec. Gener. Sphingidæ, p. 174.
1874. Larva, (fig.) *J. G. Wood,* (as D. daucus.) Ins. Abroad, p. 637.
1875. Larva, pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc.
1876. Larva, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 37.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 164.
1877. Larva, (fig.) *Saunders.* Canad. Entom., vol. 9, p. 64.
1880. Larva, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 100.
1880. Larva, (fig.) *Coquillett.* Trans. Dept. Agr. Ill., Append., vol. 18, p. 159.
1882. Larva, (fig.) *E. B. Reed,* (quotes Riley.) 12th Rept. Entom. Soc. Ontario, p. 55.
1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 255.
1886. Larva, (fig.) *Fernald.* Sphingidæ N. Engl'd, p. 57.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 196.

FOOD PLANTS. *Portulaca, Pyrus, Fuchsia, etc.,*

Philampelus vitis. Drury.

1705. Larva, pupa, (col'd figs.) *Merian.* Metam. Ins. Surinam, p. 47, pl. 47.
1797. Larva, pupa, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 79, pl. 40.
1837. Larva, pupa. *Westwood,* (quotes Abb.-Sm.) Drury's Illus. Exot. Entom., vol. 1, p. 55.
1839. Larva. *Harris,* (quotes Abb.-Sm.) Silliman's Jour. Sc. Art, vol. 36, p. 299.
1858. Larva, pupa, (col'd figs.) *Duncan.* Natural. Library, vol. 22, p. 105, pl. 7.
1859. Larva, pupa. *Clemens,* (quotes Abb.-Sm.) Jour. Acad. N. Sc. Philad.,

1868. Larva. *Saunders.* Canad. Entom., vol. 1, p. 26.
1874. Larva. *Boisdural.* Spec. Gener. Sphingidæ, p. 200.
1876. Life history, (figs.) *Riley.* 2d Missouri Rept.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 165.
1877. Larva. *Scudder.* Psyche, vol. 2, p. 68.
1880. Larva, (fig.) *Coquillett,* (quotes Clemens.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 175.
1880. Larval stages, (figs.) *J. Marten.* Trans. Dept. Agr. Ill., Append., vol. 18, p. 101.
1881. Larva. *Saunders.* Canad. Entom., vol. 13, p. 41.
1881. Larva. *W. W. Goldsmith,* (quotes Riley.) Kentucky Bureau Agr., p. 254.
1882. Larva, (fig.) *Saunders.* 12th Rept. Entom. Soc. Ontario, p. 19.
1882. Larva, pupa, (figs.) *E. B. Reed* Loc. cit., p. 60.
1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 249.
1886. Larva, (fig.) *Fernald.* Sphingidæ N. Engl'd, p. 60.
1886. Larva, (brief.) *Julia E. Saunders.* Papilio, vol. 2, p. 147.
1888. Larva, pupa, (fig.) *Grote.* 18th Rept. Entom. Soc. Ontario, p. 73.

FOOD PLANTS. *Ampelopsis, Vitis.*

Philampelus achemon. Drury.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 81, pl. 41.
1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36, p. 300.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 228.
1859. Larval stages. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larval stages. *Morris,* (quotes Clemens). Synop. Lep. N. Amer., p. 178.
1862. Larva, pupa, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 325.
1864. Larva, pupa. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 660.
1869. Larva, (fig.) *Harris.* Entom. Corres., pl. 111.
1870. Egg, larval stages. *Lintner.* 24th Rept. N. York State Cab. N. Hist., p. 116.
1874. Larva. *Boisdural,* (quotes Lorquin in lit.) Spec. Gener. Sphingidæ, p. 200.
1874. Life history. *Riley.* 2d Missouri Rept., p. 74–76.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 165.
1878. Larva, pupa, (fig.) *Saunders.* Canad. Entom., vol. 10, p. 103.
1878. Larva, (fig.) *G. H. Perkins.* 5th Rept. Vermont Board Agr., p. 279.
1879. Larva, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 74.
1880. Larva, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 101.
1880. Larva, (fig.) *Coquillett,* (quotes Clemens.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 182.
1882. Larva, (brief.) *Julia E. Saunders.* Papilio, vol. 2, p. 147.
1883. Larval stages, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 251.
1886. Larva, pupa, (figs.) *Fernald.* Sphingidæ N. Engl'd, p. 61.

FOOD PLANT. *Vitis.*

Argeus labruscæ. L.

1705. Larva, pupa, (col'd figs.) *Merian.* Metam. Ins. Surinam, p. 34, pl. 34.
1719. Larva, (col'd fig.) *Madame Merian.* Ins. of Surinam, pl. 34.
1874. Larva. *Boisdural,* (quotes Mad. Merian.) Spec. Gener. Sphingidæ, p. 193.
1886. Larva, (brief.) *Gundlach.* Entom. Cubana, p. 187.

FOOD PLANT. *Cissus.*

Pseudosphinx tetrio. L.

1832. Larva, (fig.) *Poey.* Lep. Cubana.
1874. Larva. *Boisdural,* (quotes Poey.) Spec. Gener. Sphingidæ, p. 61.
1878. Larva, pupa, (figs.) *H. Dewitz.* Wiegemann Archiv. Naturgesch., p. 9, pl. 1.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 204.
1887. Pupa. *Hy. Edwards.* Entom. Amer., vol. 3, p. 165.
1887. Pupa. *Hy. Edwards.* Canad. Entom., vol. 20, p. 14.

FOOD PLANTS. *Plumiera rubra. Jasminum.*

Pachylia ficus. L.

1719. Larva, (fig.) *Madame Merian.* Ins. of Surinam, pl. 33.
1874. Larva. *Boisduval,* (quotes Mad. Merian.) Spec. Gener. Sphingidæ, p. 137.
1884. Larva, (brief.) *W. Schaus, jr.* Papilio, vol. 4, p. 21.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 201.
1888. Larva, (brief.) *J. B. Smith,* (quotes Fab., Merian, Boisd.) Monogr. Sphing., p. 139.

FOOD PLANT. *Ficus.*

Chœrocampa tersa. L.

1797. Larva, pupa, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 75, pl. 38.
1837. Larva, pupa. *Westwood,* (quotes Abb.–Sm.) Drury's Ill. Exot. Entom., vol. 1, p. 56.
1839. Larva, pupa. *Harris,* (quotes Abb.–Sm.) Silliman's Jour. Sc. Art, vol. 33, p. 303.
1858. Larva, (col'd fig.) *Duncan.* Natural. Library, vol. 22, p. 100, pl. 6.
1859. Larva. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 172.
1874. Larva, pupa. *Boisduval,* (quotes Abbot.) Spec. Gener. Sphingidæ, p. 260.
1880. Larva. *Coquillett,* (quotes Abb.–Sm.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 159.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 56.
1886. Larva. *Fernald.* Sphingidæ N. Engl'd, p. 63.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 192.
1887. Pupa. *Hy. Edwards.* Entom. Amer., vol. 3, p. 164.

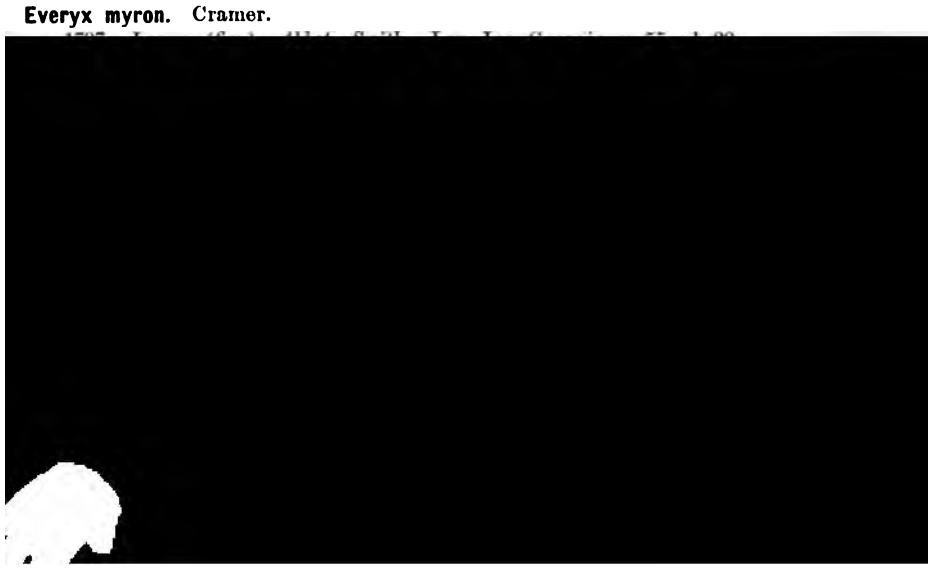
FOOD PLANT. *Rubiaceæ.*

Everyx chœrilus. Bdv.

1797. Larva, pupa. *Abbott—Smith.* Lep. Ins. Georgia, p. 53, pl. 27.
1839. Larva. *Harris,* (quotes Abb.–Sm.) Silliman's Jour. Sc. Art, vol. 36, p. 302.
1859. Larva, pupa. *Clemens,* (quotes Abb.–Sm.) Jour. Acad. N. Sc. Philad.
1862. Larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 168.
1869. Pupa. *Harris.* Entom. Corres., p. 283.
1874. Larva, pupa. *Boisduval.* Spec. Gener. Sphingidæ, p. 211.
1882. Larva. *E. B. Reed,* (quotes Abb.–Sm.) 12th Rept. Entom. Soc. Ontario, p. 57.
1883. Larva, pupa. *Edwards—Elliot.* Papilio, vol. 3, p. 126.
1886. Larva, pupa. *Fernald,* (quotes Edw.–Elliot.) Sphingidæ N. Eng'd, p. 65.

FOOD PLANTS. *Azalea, Viburnum.*

Everyx myron. Cramer.



1883. Egg, larval stages, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 245.
1885. Egg, larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 465.
1886. Egg, larva, pupa, (figs.) *Fernald.* Sphingidæ N. Engl'd, p. 66.
FOOD PLANTS. *Vitis, Ampelopsis, Viburnum.*

Ampelophaga versicolor. Harris.
1876. Larva, (brief.) *G. W. Peck.* Canad. Entom., vol. 8, p. 239.
1878. Life history. *G. D. Hulst.* Canad. Entom., vol. 10, p. 64.
1880. Larva. *Coquillett,* (quotes Hulst.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 158.
1881. Larva, (brief.) *Ph. Fischer.* Bull. Buffalo Soc. N. Sc., vol. 4, p. 62.
1885. Larva. *Ph. Fischer.* Canad. Entom., vol. 17, p. 78.
1886. Egg, larval stages, pupa. *Fernald,* (quotes Hulst.) Sphingidæ N. Engl'd, p. 68.
FOOD PLANT. *Cephalanthus occidentalis.*

Smerinthus ophthalmicus. Bois.
1869. Larva. *Boisduval.* Lep. Califor., p. 68.
1874. Larva, (col'd fig.) pupa. *Boisduval,* (quotes Lorquin in lit.) Spec. Gener. Sphingidæ, p. 34, pl. 1.
1875. Egg, larval stages. *Hy. Edwards.* Proc. Cal. Acad. Sc., April.
FOOD PLANT. *Salix.*

Smerinthus geminatus. Say.
1840. Larva, pupa. *P. H. Gosse.* Canad. Naturalist, pp. 280, 295.
1870. Egg, larval stages. *Lintner.* 24th Rept. N. York State Cab. N. Hist., p. 119.
1874. Larva. *Boisduval.* Spec. Gener. Sphingidæ, p. 39.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 62.
1886. Egg, larva. *Fernald.* Sphingidæ N. Engl'd, p. 78.
FOOD PLANTS. *Prunus, Salix, Betula, etc.*

Smerinthus excæcatus. Abb.-Sm.
1797. Larva, pupa, (figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 49, pl. 25.
1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36, p. 290.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 230.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 311.
1859. Egg, larval stages, pupa. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Egg, larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 209.
1864. Larva, pupa. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 665.
1868. Larva. *E. B. Reed.* Canad. Entom., vol. 1, p. 40.
1874. Larva, pupa. *Boisduval,* (quotes J. Leconte in lit.) Spec. Gener. Sphingidæ, p. 38, (after Abbot's drawing.)
1876. Larva. *Strecker.* Rhopal. et Heteroc., p. 55.
1877. Larva. *Packard.* Half-hours with Insects, p. 180.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 62.
1883. Larva, (figs.) *Saunders.* Ins. Inj. Fruits, p. 85.
1884. Larva, (fig.) *Saunders.* Canad. Entom., vol. 16, p. 11.
1885. Larva, (fig.) *Saunders.* 15th Rept. Entom. Soc. Ontario, p. 26.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 468.
1880. Larva, pupa, (figs.) *Fernald.* Sphingidæ N. Engl'd, p. 74.
FOOD PLANTS. *Pyrus, Prunus, Rosa.*

Smerinthus myops. Abb.-Sm.
1797. Larva, pupa, (figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 51, pl. 26.
1839. Larva. *Harris,* (quotes Abb.-Sm.) Silliman's Jour. Sc. Art, vol. 36, p. 291.
1859. Larva, pupa. *Clemens.* Jour. Acad. N. Sc. Philad., (after Abbot's figure.)
1862. Larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 208.
1874. Larva, pupa. *Boisduval,* (quotes J. Leconte in lit.) Spec. Gener. Sphingidæ, p. 42, (after Abbot's figure.)
1876. Larva, (brief.) *G. W. Peck.* Canad. Entom., vol. 8, p. 239.

1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 61
1883. Larva, pupa. *Saunders.* Ins. Inj. Fruits, p. 208.
1884. Larva. *Saunders.* Canad. Entom., vol. 16, p. 11.
1885. Larva. *Saunders.* 15th Rept. Entom. Soc. Ontario, p. 27.
1886. Larva. *Fernald.* Sphingidæ, N. Engl'd, p. 76.
1886. Larva. *R. Bunker.* Canad. Entom., vol. 18, p. 207.
FOOD PLANT. *Prunus.*

Smerinthus astylus. Drury.

1874. Larva. *Boisduval,* (quotes J. Leconte in lit.) Spec. Gener. Sphingidæ, p. 41.
1876. Larva, (brief.) *G. W. Peck.* Canad. Entom., vol. 8, p. 239.
1886. Larva. *Fernald.* Sphingidæ, N. Engl'd, p. 77.
1888. Larva, (brief.) *J. B. Smith,* (quotes Peck.) Monog. Sphing., p. 229.
FOOD PLANT. *Vaccinium corymbosum.*

Triptogon modesta. Harris.

1877. Life history. *R. Bunker.* Canad. Entom., vol. 9, p. 210.
1877. Larva. *W. V. Andrews.* Psyche, vol. 2, p. 72.
1880. Larva. *Coquillett,* (quotes Andrews.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 159.
1881. Larva, pupa. *D. S. Kellicott.* Bull. Buffalo Soc. N. Sc., vol. 4, p. 29.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 63.
1886. Life history. *Fernald,* (quotes Bunker.) Sphingidæ, N. Engl'd, p. 72.
FOOD PLANTS. *Populus, Salix.*

Cressonia juglandis. Abb.–Sm.

1797. Larva, pupa, (figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 57, pl. 29.
1839. Larva, pupa. *Harris,* (quotes Abb.–Sm.) Silliman's Jour. Sc. Art, vol. 36, p. 292.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 462.
1859. Larva, pupa. *Clemens,* (quotes Abb.–Sm.) Jour. Acad. N. Sc. Philad., July.
1862. Larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 213.
1864. Larva, pupa. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 668.
1869. Larva. *Harris.* Entom. Corres., p. 281.
1874. Larva, pupa. *Boisduval,* (quotes Abbot.) Spec. Gener. Sphingidæ, p. 27.
1876. Larva, pupa. *Strecker,* (quotes Abbot.) Rhopal. et Heteroc., p. 54.
1881. Larva. *Packard,* (quotes Harris.) Ins. Inj. Forest Trees, p. 84.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 63.
1883. Young larva. *Edwards—Elliot.* Papilio, vol. 3, p. 127.
1886. Larva, pupa. *Fernald.* Sphingidæ N. Engl'd, p. 81.
FOOD PLANTS. *Juglans, Carya.*

1876. Larva, (brief.) *W. V. Andrews.* Canad. Entom., vol. 8, p. 40.
1877. Larva. *French,* (quotes Harris.) Trans. Dept. Agr. Ill., vol 15, p. 167.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 102.
1881. Larva, (brief.) *Packard.* Ins. Inj. Forest Trees, p. 67.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 64.
1886. Egg, larva. *Fernald.* Sphingidæ N. Engl'd, p. 25.
FOOD PLANT. *Ulmus americanus.*

Daremma undulosa. Walk.
1859. Larva, (brief.) *Clemens,* (as C. repentinus.) Jour. Acad. N. Sc. Philad., July.
1862. Larva, (brief.) *Morris,* (quotes Clemens.) Synop. Lep. N. Amer , p. 206.
1870. Egg, larval stages, pupa. *Lintner.* 24th Rept. N. York State Cab. N. Hist., pp. 123–131.
1874. Larva, pupa. *Boisduval,* (as Sph. brontes.) Spec. Gener. Sphingidæ, p. 116.
1877. Larva. *W. V. Andrews.* Psyche, vol. 2, p. 73.
1880. Larva. *J. Marten,* (as D. brontes.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 102.
1880. Larva. *Coquillett,* (quotes Andrews.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 159.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 61.
1886. Life history. *Fernald.* Sphingidæ N. Engl'd, p. 28.
FOOD PLANT. *Fraxinus.*

Daremma catalpæ. Bois.
1874. Larva, pupa, (col'd figs.) *Boisduval,* (after Abbot.) Spec. Gener. Sphingidæ, p. 103, pl. 2.
1880. Larva. *J. Marten,* (quotes Boisduval.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 104.
1881. Egg, larva. *A. Koebele.* Bull. Brooklyn Entom. Soc., vol. 4, p. 20.
1882. Life history, (figs.) *Riley.* Rept. U. S. Dept. Agr., pp. 192–193, pl. 13
FOOD PLANT. *Catalpa cordifolia.*

Diludia jasminearum. Bois.–Lec.
1859. Pupa, (brief.) *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Pupa, (brief.) *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 199.
1874. Larva, pupa, (col'd fig.) *Boisduval.* Spec. Gener. Sphingidæ, p. 115, pl. 1.
1880. Larva. *J. Marten,* (quotes Boisduval.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 103.
FOOD PLANT. *Fraxinus.*

Amphonyx antæus. Drury.
1719. Larva, pupa, (col'd figs.) *Madame Merian.* Ins. of Surinam, pl. 2.
1874. Larva, pupa. *Boisduval,* (quotes Mad. Merian.) Spec. Gener. Sphingidæ, p. 65.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 206.
1887. Pupa. *Hy. Edwards.* Entom. Amer., vol. 3, p. 161.
1888. Larva, (brief.) *J. B. Smith.* Monog. Sphing., p. 154
FOOD PLANT. Species of *Jatropha.*

Phlegethontius rustica. Fab.
1797. Larva, pupa, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 67, pl. 34.
1858. Larva, (col'd fig.) *Duncan.* Natural. Library, vol. 22, p. 102, pl. 6.
1859. Larva, pupa. *Clemens.* Jour. Acad. N. Sc. Philad. (quotes Abbot), July.
1862. Larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 187.
1874. Larva, pupa. *Boisduval.* Spec. Gener. Sphingidæ, p. 83.
1878. Larva, pupa. *H. Dewitz.* Wiegemann Archiv. Naturgesch., p. 10.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 209.
1887. Pupa. *Hy. Edwards.* Entom. Amer. vol. 3, p. 164.
FOOD PLANTS. *Chionanthus, Jasminium.*

Phlegethontius carolina. L.

1705. Larva, pupa, (col'd figs.) *Merian.* Matam. Ins. Surinam, p. 57, pl. 57.
1797. Larva, pupa, (col'd figs.) *Abbot—Smith.* Lep Ins. Georgia, p. 65, pl. 3[illegible].
1828. Larva, (col'd fig.) *Curtis.* British Entom., vol. 5, pl. 195.
1828. Larva, pupa, (brief.) *Stephens,* (quotes Abb.–Sm.) Illus. Brit. Entom. vol. 1, p. 118.
1837. Larva, pupa. *Westwood,* (quotes Abb.–Sm.) in Drury. Illus. Exot. Entom., vol. 1, p. 47.
1839. Larva, pupa. *Harris.* Silliman's Jour. Sc. Art, vol. 36, p. 294.
1852. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 246.
1859. Larva, pupa. *Clemens.* Jour. Acad. Sc. Philad., July.
1859. Pupa. *P. H. Gosse.* Letters from Alabama, p. 66.
1862. Larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 189.
1862. Larva, pupa, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 322.
1869. Larva. *Harris.* Entom. Corres., p. 126, (quotes Doubleday lit.)
1869. Larva. *Harris.* Loc. cit., p. 282.
1873. Larva, pupa, (figs.) *T. Glover.* Rept. U. S. Dept. Agr., p. 157.
1874. Larva. *Boisduval,* (after Abbot.) Spec. Gener. Sphingidæ, p. 70.
1874. Larva. *Boisduval,* (var. lycopersici.) Loc. cit., p. 72.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 168.
1878. Larva, pupa. *H. Dewitz.* Wiegemann Archiv. Naturgesch., p. 12.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 103.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 158.
1882. Larva. *J. Leidy.* Proc. Acad. N. Sc. Philad., p. 237.
1885. Larva, pupa, (fig.) *Fernald.* Kingsley's Stand. N. Hist., vol. 2, pp. 464–468
1886. Larva. *Fernald.* Sphingidæ N. Engl'd, p. 32.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 210.

Food Plants. Various species of *Solanum, Datura, etc.*

Phlegethontius celeus. Hübn.

1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 226.
1852. Larva, pupa, (brief.) *Harris.* Ins. Inj. Vegetat., 2d edit., p. 247.
1859. Larva, pupa. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1859. Larva. *Jaeger.* Life N. Amer. Ins., p. 189.
1862. Larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 190

Phlegethontius cingulata. Fabr.

1797. Larva, pupa, (figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 63, pl. 32.
1837. Larva, pupa. *Westwood,* (quotes Abb.–Sm.) Drury's Illus. Exot. Entom., vol. 1, p. 50.
1839. Larva, pupa. *Harris,* (quotes Abb.–Sm.) Silliman's Jour. Sc. Art, vol. 36, p. 294.
1859. Larva, pupa. *Clemens,* (quotes Abb.–Sm.) Jour. Acad. N. Sc. Philad., July.
1862. Larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 189.
1864. Larva, pupa. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 650.
1869. Larva. *Harris,* (as Sph. convolvuli.) Entom. Corres., p. 282.
1874. Larva, pupa. *Boisduval.* Spec. Gener. Sphingidæ, p. 96.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 104.
1880. Larva. *Coquillett,* (quotes Ab.–Sm.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 158.
1886. Larva, pupa. *Fernald.* Sphingidæ N. Engl'd, p. 36.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 212.

FOOD PLANT. *Convolvulus batatas.*

Sphinx drupiferarum. Abb.–Sm.

1797. Larva, pupa, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 71, pl. 36.
1839. Larva, pupa. *Harris,* (quotes Abb.–Sm.) Silliman's Jour. Sc. Art, vol. 36, p. 294.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 362.
1859. Larva, pupa. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva, pupa. *Morris,* (quotes Clemens. Synop Lep. N. Amer., p. 197.
1864. Larva, pupa. *Lintner.* Proc. Entom Soc. Philad vol. 3, p. 658.
1871. Egg, larval stages, pupa, (figs.) *E. B. Reed.* Canad. Entom., vol. 3, p. 5.
1871. Larva, pupa, (figs.) *E. B. Reed.* Rept. Entom. Soc. Ontario, p. 362.
1874. Larva, pupa. *Boisduval,* (quotes Abb.–Sm.) Spec. Gener. Sphingidæ, p. 98.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 104.
1882. Larva, pupa, (figs.) *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 67.
1883. Larva, (brief.) *Ph. Fischer.* Canad. Entom., vol. 15, p. 238.
1883. Egg, larval stages, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 163.
1886. Egg, larva, pupa, (figs.) *Fernald.* Sphingidæ N. Engl'd, p. 40.

FOOD PLANTS. *Prunus, Celtis.*

Sphinx kalmiæ. Abb.–Sm

1797. Larva, pupa, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 73, pl. 37.
1839. Larva. *Harris,* (quotes Abb.–Sm.) Silliman's Jour. Sc. Art, vol. 36, p. 295.
1840. Egg, young larva. *P. H. Gosse.* Canad. Naturalist, p. 260.
1859. Larva, pupa. *Clemens,* (quotes Abb.–Sm.) Jour. Acad. N. Sc. Philad., July.
1862. Larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 196.
1864. Larva, pupa. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 657.
1874. Larva, pupa. *Boisduval.* Spec. Gener. Sphingidæ, p. 92.
1880. Larva. *J. Marten.* Trans. Dept Agr Ill., vol. 18, Append., p. 104.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 68.
1886. Larva, pupa. *Fernald.* Sphingidæ N. Engl'd, p. 41.

FOOD PLANTS. *Kalmia, Chionanthus, Syringa, Fraxinus.*

Sphinx chersis. Hübn.

1864. Larva, pupa. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 655.
1869. Larva. *Harris.* Entom. Corres., p. 282.
1877. Larva. *Scudder.* Psyche. vol. 2, p. 76.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 105.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 65.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 127.

1886. Larva, pupa. *Fernald.* Sphingidæ N. Engl'd, p. 42.
FOOD PLANT. *Syringa.*

Sphinx gordius. Cramer.
1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36, p. 295.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 341.
1859. Larva, pupa. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva, pupa. *Morris.* Synop. Lep. N. Amer., p. 198.
1877. Larva. *Packard.* Half-hours with Insects, p. 180.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 105.
1883. Larva, pupa, (brief.) *Saunders.* Ins. Inj. Fruits, p 86.
1886. Larva. *Fernald.* Sphingidæ N. Engl'd, p. 45.
FOOD PLANT. *Pyrus.*

Sphinx lugens. Walk.
1875 Larva, pupa. *F. H. Snow.* Trans. Kansas Acad. Sc., vol. 4, p. 28.

Sphinx eremitus. Hübn.
1870. Larva, (fig.) *T. Glover.* Rept. U. S. Dept. Agr., p. 80.
1879. Larva. *T. W. Tyler.* Canad. Entom., vol. 11, p. 59.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 69.
1886. Larva, pupa. *Fernald.* Sphingidæ N. Engl'd, p. 47.
FOOD PLANTS. *Mentha, Monarda, Salvia.*

Sphinx elsa. Strecker.
1888. Larva. *Hy. Edwards.* Entom. Amer., vol. 4, p. 61.

Sphinx luscitiosa. Clem.
1888. Larval stages, pupa. *Caroline G. Soule.* Psyche, vol. 5, p. 85.

Dolba hylæus. Drury.
1797. Larva, pupa, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 69, pl. 35.
1837. Larva, pupa. *Westwood,* (quotes Abb.–Sm.) *Drury.* Illus. Exot. Entom., vol. 2, p. 49.
1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36, p. 296.
1859. Larva, pupa. *Clemens,* (quotes Abb.–Sm.) Jour. Acad. N. Sc. Philad., July.
1862. Larva, pupa. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 204.
1874. Larva, pupa. *Boisdural.* Spec. Gener. Sphingidæ, p. 99.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 70.
1884. Larva. *W. H. Harrington.* Canad. Entom., vol. 16, p. 55.
1886. Larva. *Fernald.* Sphingidæ N. Engl'd, p. 49.
FOOD PLANT. *Prinos.*

Dilophonota ello. L.
1719. Larva, pupa, (col'd figs.) *Madame Merian.* Ins. Surinam.

Hyloicus cupressi. Bois.

1874. Larva, pupa, (col'd figs.) *Boisduval*, (after Abbot's drawing.) Spec. Gener. Sphingidæ, p. 102, pl. 2.

FOOD PLANT. *Cupressus thyoides.*

Ellema coniferarum. Abb.–Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 83, pl. 42.
1839. Larva. *Harris*, (after Abbot.) Silliman's Jour. Sc. Art, vol. 36, p. 297.
1840. Larva, (brief.) *Westwood.* Intr. Mod. Class. Ins., vol. 2, p. 367.
1858. Larva, (brief.) *Fitch.* 4th Rept. Ins. N. York, p. 742.
1859. Larva. *Clemens.* Jour. Acad. N. Sc. Philad. (quotes Abb.–Sm.), July.
1862. Larva. *Morris*, (quotes Clemens.) Synop. Lep. N. Amer., p. 199.
1874. Larva, pupa. *Boisduval*, (after Abbot.) Spec. Gener. Sphingidæ, p. 105.
1880. Larva. *J. Marten*, (quotes Fitch, Abb.–Sm.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 105.
1881. Egg, larva. *A. Koebele.* Bull. Brooklyn Entom. Soc., vol. 4, p. 20.
1881. Larva, (brief.) *Packard.* Ins. Inj. Forest Trees, p. 201.
1886. Egg, larva. *Fernald.* Sphingidæ N. Engl'd, p. 85.
1887. Pupa. *Hy. Edwards.* Entom. Amer., vol. 3, p. 167.

FOOD PLANT. *Pinus palustris.*

Ellema bombycoides. Walk.

1859. Larva, (brief.) *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva, (brief.) *Morris*, (quotes Clemens.) Synop. Lep. N. Amer., p. 216.
1864. Larva, pupa. *Lintner.* Proc. Entom. Soc. Philad., vol. 3, p. 669.
1869. Larva, pupa, (figs.) *Lintner.* 23d Rept. N. York State Cab. N. Hist., p. 171.
1869. Larva. *Packard.* Guide to Study of Insects, p. 272.
1874. Larva, pupa. *Boisduval.* Spec. Gener. Sphingidæ, p. 106.
1877. Larva. *W. V. Andrews.* Psyche, vol. 2, p. 79.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 105.
1881. Larva, pupa. *Packard*, (quotes Lintner.) Ins. Inj. Forest Trees, p. 202.
1882. Larva. *E. B. Reed.* 12th Rept. Entom. Soc. Ontario, p. 70.
1886. Larva. *Fernald.* Sphingidæ N. Engl'd, p. 84.

FOOD PLANT. *Pinus* of various species.

Ellema pineum. Lintn.

1869. Larva. *Lintner.* 23d Rept. N. York State Cab. N. Hist., p. 170.
1874. Larva. *Boisduval*, (quotes Lintner.) Spec. Gener. Sphingidæ, p. 107.
1880. Larva. *J. Marten*, (quotes Lintner.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 105.
1881. Larva. *Packard*, (quotes Lintner.) Ins. Inj. Forest Trees, p. 202.

FOOD PLANT. *Pinus strobus.*

ÆGERIADÆ.

Melittia ceto. Westw.=**cucurbitæ.** Harr.

1828. Larva. *Harris.* N. Engl'd Farmer, vol. 7, p. 33.
1839. Larva, cocoon, pupa. *Harris*, (as Aeg. cucurbitæ.) Silliman's Jour. Sc. Art, vol. 36.
1842. Larva. *Harris.* N. Engl'd Farmer, vol. 20, p. 260.
1852. Pupa, cocoon, (brief.) *Harris.* Ins. Inj. Vegetat., 2d edit., p. 252.
1862. Larva, cocoon, pupa. *Morris*, (quotes Harris.) Synop. Lep. N. Amer., p. 139.
1862. Larva, cocoon, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 331.
1869. Larva. *Harris.* Entom. Corres., p. 284.
1871. Larva, cocoon, (figs.) *E. B. Reed.* Rept. Entom. Soc. Ontario, p. 429.
1874. Larva. *Boisduval*, (after Abbot.) Spec. Gener. Sphingidæ, p. 170.
1877. Larva, (fig.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 769.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 173.

1880. Larva, cocoon. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 107.
1883. Egg, (brief.) *Saunders.* Ins. Inj. Fruits, p. 361.
1883. Larva, pupa, (figs.) *Saunders.* Loc. cit., p. 361.
1885. Larva, cocoon, (figs.) *Lintner,* (quotes Harris.) 2d Rept. State Entom. N. York, p. 59.
1885. Larva, pupa. *Scudder.* Psyche, vol. 4, p. 303.
FOOD PLANTS. *Cucurbitaceæ* of various species.

Alcathoe caudatum. Harris.
1839. Larva, (brief.) *Harris.* Silliman's Jour. Sc. Art, vol. 36.
1862. Larva, (brief.) *Morris,* (quotes Harris.) Synop. Lep. N. Amer., p. 139.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 424.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 172.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 108.
FOOD PLANTS. *Ribes, Clematis,* (stems.)

Trochilium apiforme. L.
1828. Larva, pupa. *Stephens.* Illus. Brit. Entom., Haust., vol. 1, p. 137.
1836. Larva. *J. Duncan.* Natural. Library, vol. 4, Entom., p. 173.
1840. Larva, pupa, (col'd figs.) *Ratzeburg.* Die Forst-Insecten, vol. 2, p. 73, pl. 3, 4.
1848. Larva, (col'd fig.) *Humphreys.* Genera British Moths, p. 13, pl. 4.
1857. Larva. *Stainton.* Manual Brit. Butt. and Moths, p. 102.
1872. Larva, (brief.) *J. G. Wood.* Insects at Home, p. 427.
1872. Larva. *Figuier.* Insect World (Duncan's edit.), p. 193.
1874. Larva, cocoon, pupa, (figs.) *P. M. Duncan.* Transfor. of Ins., p. 95.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 77.
FOOD PLANTS. Trunks of *Willow* and *Poplar.*

Fatua denudata. Harris.
1852. Pupa, (brief.) *Harris.* Ins. Inj. Vegetat., 2d edit., p. 252.
1862. Pupa, (brief.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 330.
FOOD PLANT. *Fraxinus,* (stems and trunk.)

Bembecia marginata. Harris.
1874. Larva. *Riley,* (as Æg. rubi.) 6th Missouri Rept., p. 113.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 175.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., p. 18, Append., p. 108.
1881. Larva. *Riley.* Suppl. Missouri Rept's, p. 72.
1883. Egg. *G. D. Hulst.* Bull. Brooklyn Entom. Soc., vol. 6, p. 8.
FOOD PLANT. Stems of *Rubus.*

Sciapteron tricincta. Harris.
1881. Larva, (brief.) *D. S. Kellicott.* Bull. Buffalo Soc. N. Sc., p. 62.

Harmonia pini. Kellicott.

1881. Larva, pupa. *D. S. Kellicott.* Canad. Entom., vol. 13, p. 6.
1881. Larva, pupa. *Packard*, (quotes Kellicott.) Ins. Inj. Forest Trees, p. 180.
FOOD PLANT. *Pinus*, (trunk and stem.)

Podosesia syringæ. Harris.

1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36.
1870. Larva. *Packard.* Inj. Ins., new or little known, p. 18.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 174.
1880. Larva, pupa. *Herbert Osborn.* Trans. Iowa Hortic. Soc., vol. 15, p. 107.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 10[illegible].
1881. Larva. *Hy. Edwards.* Papilio, vol. 1, p. 184.
1882. Life history, (fig.) *G. D. Hulst.* Bull. Brooklyn Entom. Soc., vol. 5, p. 17.
FOOD PLANTS. *Fraxinus, Syringa*, (trunk and stem.)

Sannina exitiosa. Say.

1825. Pupa, cocoon. *Say.* Amer. Entom., vol. 2, pl. 19.
1826. Larva. *Harris.* N. Engl'd Farmer, vol. 5, p. 33.
1839. Larva. *Harris.* Silliman's Jour Sc. Art, vol. 36.
1843. Egg, larva. *Willis Gaylord.* Trans. N. York Agr. Soc., p. 161.
1854. Larva, cocoon. *Emmons.* Nat. Hist. N York, vol. 5, p. 223.
1854. Egg, larva, pupa. *Fitch.* 1st Rept. ns. N. York, pp. 108–116.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 356.
1859. Larva, pupa. *P. H. Gosse.* Letters from Alabama, p. 146.
1862. Larva. *Morris*, (quotes Harris.) Synop. Lep. N. Amer., p. 140.
1862. Larva, pupa, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 331.
1865. Larva. *B. D. Walsh.* Practical Entom., p. 67.
1869. Larva. *Riley.* 1st Missouri Rept., p. 47.
1871. Larva. *Saunders.* Canad. Entom., vol. 3, p. 22.
1873. Larva, pupa. *A. J. Cook.* 12th Rept. Michigan Board Agr., p. 136.
1876. Egg, larva. *Cyrus Thomas.* Trans. Dept. Agr. Ill., vol. 14, p. 38.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 179.
1879. Egg. *J. H. Comstock.* Rept. U. S. Dept. Agr., p. 254.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill. vol. 18, Append., p. 107.
1883. Egg, larva, pupa, (fig.) *Saunders.* ns. Inj. Fruits, p. 192.
1884. Egg, larva, cocoon, (fig.) *T. J. Edge.* Rept. Agr. Pennsylv., p. 104.
1885. Egg, larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 464.
FOOD PLANT. *Persica*, (peach trees.)

Ægeria pictipes. G. and R.

1879. Life history, (figs.) *J. S. Bailey.* N. Amer. Entom., vol. 1, p. 17.
1880. Larva, pupa, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 109.
FOOD PLANT. *Prunus*, (trunk and stem.)

Ægeria pyri. Harris.

1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36.
1856. Larva. *Fitch* 3d Rept. Ins. N. York, p. 349.
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 335.
1862. Larva, (brief.) *Morris*, (quotes Harris.) Synop. Lep. N. Amer., p. 141.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 170.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 107.
FOOD PLANT. *Pyrus*, (trunk and stem.)

Ægeria acerni. Clem.

1874. Larva, cocoon, pupa, (figs.) *Riley.* 6th Missouri Rept., pp. 107–110.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 173.
1880. Larva, cocoon, (figs.) *J. Marten*, (after Riley.) Trans. Dept. Agr. Ill., vol. 18. Append., p. 108.
1881. Larva, (fig.) *Packard*, (quotes Riley.) Ins. Inj. Fruits, p. 107.
1881. Life history. *Saunders.* Canad. Entom., vol. 13, p. 69.

1882. Life history, (brief.) *Saunders.* 12th Rept. Entom. Soc. Ontario, p. 20.
FOOD PLANT. *Acer*, (stems.)

Ægeria tipuliformis. L.

1828. Larva. *Stephens.* Illus. Brit. Entom., Haust., vol. 1, p. 142.
1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36.
1848. Larva, (col'd fig.) *Humphreys.* Gener. Brit. Moths, p. 13, pl. 4.
1851. Larva. *Harris.* Hovey's Magaz. Hortic , vol. 17, p. 241.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 423.
1857. Larva. *Stainton.* Manual Brit. Butt. and Moths, p. 106.
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 334.
1865. Larva. *B. D. Walsh.* Practical Entom., p. 29.
1871. Life history, (brief.) *Saunders.* Rept. Entom. Soc. Ontario, p. 381.
1872. Larva, (brief.) *J. G. Wood.* Insects at Home, p. 427.
1873. Larva, cocoon. *A. J. Cook.* 12th Rept. Board Agr. Michigan, p. 140.
1879. Egg, larva. *Saunders.* Rept. Entom. Soc. Ontario, p. 76.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 107.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 151.
1882. Larva, (col'd fig.) *W. F. Kirby.* Europ. Butt. and Moths, p. 78, pl. 20
1883. Life history, (brief.) *Saunders.* Ins. Inj. Fruits, p. 336.
1885. Life history, (figs.) *Lintner.* 2d Rept. State Entom. N. York, p. 60.
1888. Larva, pupa, (figs.) *Bethune.* 18th Rept. Entom. Soc. Ontario, p. 54.
FOOD PLANT. *Ribes*, (stems.)

Ægeria prosopis. Hy. Edw.

1882. Gall. *Hy. Edwards.* Papilio, vol. 2, p. 99.
FEEDS in stems of *Prosopis*, making a gall.

Ægeria hemizoniæ. Hy. Edw.

1883. Larva. *J. J. Rivers.* Papilio, vol. 3, p. 26.
FOOD PLANT. *Rubus*, (root and stems.)

THYRIDÆ.

Thyris vitrina. Boisd.

1829. Larva. *Boisduval*, (after Abbot's drawing.) Monogr. Zygænidæ, p. 19.
1874. Larva. *Boisduval*, (after Abbot's drawing.) Spec. Gener. Sphingidæ, p. 490.
FOOD PLANT. *Phaseolus.*
NOTE.—This insect appears to be unknown to American entomologists.

ZYGÆNIDÆ.

Alypia octomaculata. Fabr.

1874. Larva, (fig.) *J. G. Wood.* Insects Abroad, p. 651.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 176.
1877. Larva, (figs.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 785.
1878. Larva, (fig.) *G. H. Perkins.* 5th Rept. Vermont Board Agr., p. 276.
1880. Larva, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 110.
1880. Larva, (fig.) *Coquillett,* (quotes Riley.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 172.
1881. Larva, (brief.) *W. W. Goldsmith,* (quotes Riley.) Kentucky Bureau Agr., p. 255.
1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 263.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 463.

FOOD PLANTS. *Vitis, Ampelopsis.*

Psychomorpha epimenis. Drury.

1869. Larva, (brief.) *Doubleday,* (quotes Abbot in lit.) Harris's Entom. Corres., p. 130.
1871. Larva, pupa, (figs.) *Riley* 3d Missouri Rept., p. 64.
1872. Larva, (fig.) *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 121.
1873. Larva, (brief, col'd fig.) *Stretch.* Zygæn. Bombyc. N. Amer., p. 18, pl. 10.
1874. Larva, pupa, (figs.) *Riley.* 6th Missouri Rept., p. 88.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 177.
1880. Larva, pupa, (figs.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 111.
1880. Larva, (fig.) *Coquillett,* (quotes Lintner.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 172.
1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 264.

FOOD PLANTS. *Bignonia radicans, Vitis.*

Euscirrhopterus gloveri. Grote.

1887. Life history. *E. A. Popenoe.* The Industrialist, Oct. 1, (quoted in Entom. Amer.), vol. 3, p. 178.
1888. Larva, pupa, (figs.) *Riley.* Insect Life, vol. 1, p. 104.

FOOD PLANT. *Portulaca.*

Eudryas unio. Hübn.

1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 399.
1861. Pupa, (brief.) *J. Kirkpatrick.* Proc. Entom. Soc. Philad., p. 43.
1868. Larva, pupa. *J. Kirkpatrick.* Ohio Farmer, Feb. 8.
1870. Larva, (fig.) *Riley.* 2d Missouri Rept., p. 83, (in error for P. epimenis.)
1873. Larva, (brief.) *Stretch.* Zygæn. Bombyc. N. Amer. p. 150.
1874. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 118.
1874. Larva. *Riley,* (quotes Lintner.) 6th Missouri Rept., p. 92.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 178.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append , p. 111.
1880. Larva. *Coquillett,* (quotes Lintner.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 173.
1881. Larva, (brief.) *D. S. Kellicott.* Bull. Buffalo Soc. N. Sc., vol. 4, p. 29.
1883. Larva, pupa. *Saunders.* Ins. Inj. Fruits, p. 262.

FOOD PLANT. *Vitis.*

Eudryas grata. Fabr.

1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 310.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 329.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 399.
1859. Larva. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 427.
1862. Larva. *Morris,* (quotes Harris.) Synop. Lep. N. Amer., p. 246.
1864. Larva, pupa, (figs.) *Packard.* Notes on Zygæn. Proc. Essex Inst., vol. 4, p. 27.
1869. Larva. *Harris.* Entom. Corres., p. 306.

1869. Larva. *Packard.* Guide to Study of Insects, p. 281.
1870. Larva, pupa, (figs) *Riley.* 2d Missouri Rept., p. 83.
1874. Egg, larva, (figs.) *Lintner.* 26th Rept. State Cab. N. Hist., p. 123.
1874. Egg, larva, pupa, (figs.) *Riley.* 6th Missouri Rept., p. 89.
1875. Life history, (figs.) *Saunders.* Canad. Entom., vol. 7, p. 41.
1875. Egg, larva, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 38.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 178.
1880. Egg, larva, (figs.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 111.
1880. Egg, larva, (figs.) *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 173.
1883. Egg, larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 259.
1885. Egg, larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 462.
1888. Egg, larva, (figs.) *Fletcher.* Rept. Entom. Dept. Agr. Canad., p. 30.

FOOD PLANTS. *Vitis, Ampelopsis.*

Cosmosoma omphale. Hübn.

1886. Larva, cocoon. *Gundlach.* Entom. Cubana, p. 239.
1886. Pupa, cocoon. *J. B. Smith.* Entom. Amer., vol. 1, p. 186.

FOOD PLANT. *Mikania.*

Scepsis edwardsii. Grote.

1887. Larva. *Hy. Edwards.* Entom. Amer., vol. 3, p. 167.

Scepsis fulvicollis. Hübn.

1880. Larva. *Coquillett.* Canad. Entom., vol. 12, p. 44.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 171.

FOOD PLANTS. *Grasses.*

Ctenucha virginica. Charp.

1862. Larva, cocoon, (brief.) *Packard.* 7th Rept. Maine Board Agr., p. 168.
1864. Egg, larva, cocoon, pupa, (figs.) *Packard.* Notes on Zygæn. Proc. Essex Inst., vol. 4, p. 36.
1872. Larva, cocoon. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 155.
1873. Larva, cocoon. *Stretch,* (quotes Packard.) Zygæn. Bombyc. N. Amer., p. 26.
1877. Larva, pupa, (col'd figs.) *Packard.* Half-hours with Insects, (frontisp.)
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 170.

FOOD PLANTS. *Grasses.*

Ctenucha multifaria. Walk.

1874. Egg, young larva, pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc., p. 344.

Acoloithus falsarius. Clem.

1883. Egg, larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 265.
1885. Larva, (fig.) *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 462.
FOOD PLANTS. *Vitis, Ampelopsis.*

Lycomorpha pholus. Drury.
1839. Larva. *Harris.* Silliman's Jour. Sc. Art, vol. 36, p. 318.
1862. Larva. *Morris,* (quotes Harris.) Synop. Lep. N. Amer., p. 135.
1862. Larva, (brief.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 341.
1873. Larva. *Stretch,* (quotes Harris.) Zygæn. Bombyc. N. Amer., p. 42.
1885. Larva. *Fernald,* (quotes Harris.) Kingsley's Stand. N. Hist., vol. 2, p. 462.
FOOD PLANTS. *Lichens.*

Oeta aurea. Fitch.
1869. Larva, pupa, (figs.) *Riley.* 1st Missouri Rept., p. 151.
1873. Larva. *Stretch,* (quotes Riley.) Zygæn. Bombyc. N. Amer., p. 241.
1881. Egg. *Riley.* Papilio, vol. 1, p. 110.
FOOD PLANT. *Ailanthus.*

BOMBYCES.

Sub-fam. **Nycteolidæ.**

Sarrothripa reveyana. S. V.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 190.
1859. Larva, cocoon, pupa, (col'd figs.) *Humphreys.* Genera Brit. Moths, p. 49.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 294.
FOOD PLANT. *Salix.*

Sub-fam. **Lithosiidæ.**

Nola ovilla. Grote.
1884. Larva, cocoon. *Packard.* Amer. Naturalist, vol. 18, p. 726.
FOOD PLANT. *Quercus.*

Nola sorghiella. Riley.
1882. Larva, pupa, (figs.) *Riley.* Rept. U. S. Dept. Agr., p. 187, pl. 11.

Hypoprepia fucosa. Hübn., (incl. vars.)
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 241.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 262.
1862. Larva, cocoon. *Harris.* Ins Inj. Vegetat., Flint's edit., p. 342.
1862. Larva. *Morris,* (quotes Harris.) Synop. Lep. N. Amer., p. 256.
1871. Larva. *Saunders.* Canad. Entom., vol. 3, p. 36.
1873. Larva, cocoon. *Stretch,* (quotes Harris.) Zygæn. Bombyc. N. Amer., p. 47.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 184.
1880. Larva. *Coquillett.* Canad. Entom., vol. 12, p. 45.
FOOD PLANT. *Lichens.*

Cisthene subjecta. Walk.
1881. Larva, pupa. *Mary E. Murtfeldt,* (as C. packardi.) Psyche, vol. 3, p. 243.
FOOD PLANT. *Lichens.*

Byssophaga nexa. Boisd.
1878. Egg, larva, pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc., June.
FOOD PLANT. *Lichens.*

Eustixis pupula. Hübn.
1870. Larva, pupa, (fig.) *Packard,* (after Abbot's drawing.) Amer. Naturalist, vol. 4, p. 229.
FOOD PLANT. *Sideronytum tenax.*

Euphanessa mendica. Walk.
1871. Egg, larva. *Saunders.* Canad. Entom., vol. 3, p. 227.
1873. Egg, larva. *Stretch,* (quotes Saunders.) Zygæn. Bombyc. N. Amer., p. 53.
1886. Larva, pupa. *G. D. Hulst.* Entom. Amer., vol. 1, p. 167.

Sub-fam. **Dioptidæ.**

Phryganidea californica. Packard.

1873. Larva, pupa, (col'd figs.) *Stretch.* Zygæn. Bombyc. N. Amer., p. 91, pl. 10.
1874. Egg, larval stages. *Hy. Edwards.* Proc. Cal. Acad. Sc., Sept.
1877. Egg, larva. *Packard,* (quotes Hy. Edwards.) Inj. Ins. West, Hayden's Rept., p. 808.
1881. Egg, larva, pupa. *Packard,* (quotes Stretch and Hy. Edw.) Ins. Inj. Forest Trees, p. 43.

FOOD PLANT. *Quercus.*

Sub-fam. **Arctiidæ.**

Crocota quinaria. Grote.

1869. Larva. *Saunders,* (as Arct. bimaculata.) Canad. Entom., vol. 2, p. 4.

FOOD PLANTS. *Taraxacum, Chenopodium, etc.*

Utetheisa bella. L.

1870. Larva, pupa, (figs.) *T. Glover.* Rept. Dept. Agr., p. 80.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 113.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 128.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 258.

FOOD PLANTS. *Myrica, Lespedeza, Prunus, Crotalaria, etc.*

Callimorpha interrupto-marginata. De Beauv.

1878. Larva, (brief.) *C. G. Siewers.* Canad. Entom., vol. 10, p. 84.

Callimorpha confusa. Lyman.

1887. Life history. *H. H. Lyman.* Canad. Entom., vol. 19, p. 186.

FOOD PLANT. *Cynoglossum officinale.*

Callimorpha clymene. Esp.

1871. Larva, (brief.) *Riley.* 3d Missouri Rept., p. 134.

FOOD PLANT. *Quercus.*

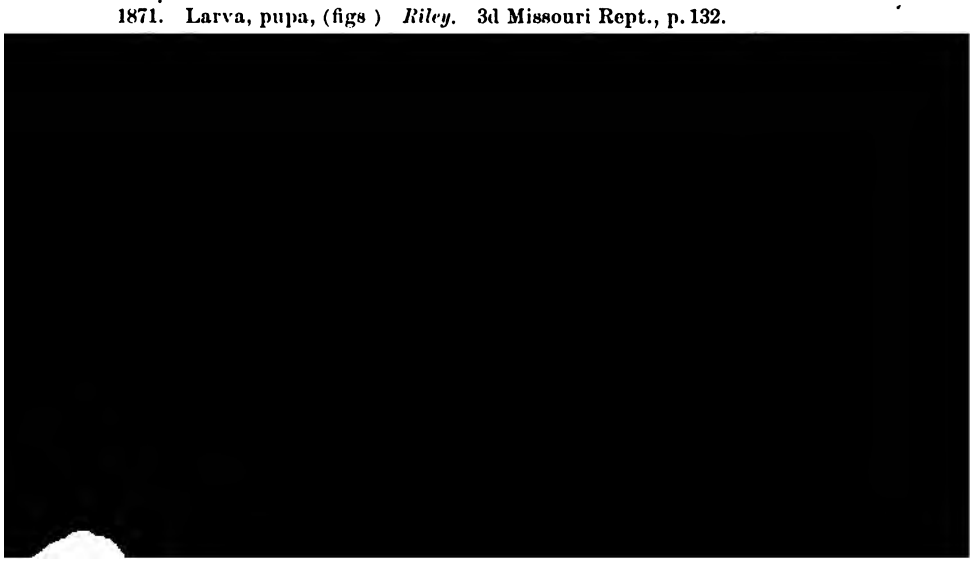
Callimorpha lecontei. Boisd.

1868. Larva. *Saunders.* Canad. Entom., vol. 1, p. 20.
1871. Larva, pupa, (figs.) *Le Baron.* 2d Illinois Rept., p. 47.
1872 Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 142.
1873. Larva. *Stretch,* (quotes Saunders.) Zygæn. Bombyc. N. Amer., p. 64.
1877. Larva. *French,* (quotes Saunders) Trans. Dept. Agr. Ill., vol. 15, p. 181.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 115.
1883. Larva, pupa, (fig.) *Saunders.* Ins. Inj. Fruits, p. 198.

FOOD PLANT. *Triosteum perfoliatum.*

Callimorpha fulvicosta. Clem.

1871. Larva, pupa, (figs) *Riley.* 3d Missouri Rept., p. 132.



1863. Larva. *Saunders.* Proc. Entom. Soc. Philad., vol. 2, p 28.
1866. Larva. *Packard.* Proc. Boston Soc. N. Hist., vol. 11, p. 34.
1869. Larva. *Harris.* Entom. Corres., p. 287.
1870. Egg, larval stages, *Lintner.* 24th Rept. N. York State Cab. N. Hist., p. 134.
1873. Larva. *Stretch.* Zygæn. Bombyc. N. Amer., p. 96.
1875. Life history. *R. Bunker.* Canad. Entom., vol. 7, p. 149.
1876. Larva, (brief.) *H. H. Lyman.* Canad. Entom., vol. 8, p. 20.
FOOD PLANTS. *Lactuca, etc.*

Arctia virgo. L.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 123, pl. 62.
1840. Larva, cocoon, (brief.) *P. H. Gosse.* Canad. Naturalist, p. 222.
1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 244.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit , p. 265.
1854. Larva. *Emmons.* Nat. Hist. N. York, vol. 5, p. 229.
1858. Larva, pupa, (col'd figs.) *Duncan.* Natural. Library, vol. 22, p. 176.
1862. Larva, (brief.) *Morris,* (quotes Duncan.) Synop. Lep. N. Amer., p. 338.
1863. Larva, (brief.) *Saunders.* Canad. Journ., new series, vol. 8, p. 354.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 167.
1873. Larva. *Stretch.* Zygæn. Bombyc. N. Amer., p. 127.
FOOD PLANTS. *Chenopodiaceæ, etc.*

Arctia saundersii. Grote.
1863. Larva. *Saunders,* (as A. parthenice.) Proc. Entom. Soc. Philad., vol. 2, p. 28.
1863. Larva. *Saunders,* (as A. parthenice.) Canad. Journ., new series, vol. 8, p. 353.
1864. Larva. *Grote,* (quotes Saunders.) Proc. Entom. Soc. Philad., vol. 3, p. 75.
1873. Larva, pupa. *Saunders.* Rept. Entom. Soc. Ontario, p. 23.
FOOD PLANTS. *Chenopodiaceæ, etc.*

Arctia achaia. G. and R.
1873. Larva, pupa. *Stretch.* Zygæn. Bombyc. N. Amer., p. 125.
FOOD PLANTS. *Trifolium, Erodium, etc.*

Arctia figurata. Drury.
1878. Larva. *E. L. Graef.* Bull. Brooklyn Entom. Soc., vol. 1, p. 3.

Arctia quenselii. Geyer.
1873. Larva, (fig.) *Packard.* Hayden's Surv. Territ., p. 558.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 105.
FOOD PLANTS. *Lonicera, Taraxacum.*

Arctia phyllira. Drury.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 127, pl. 64.

Arctia nais. Drury.
1877. Larva. *French,* (as A. phalerata.) Trans. Dept. Agr. Ill., vol. 15, p. 182.
1880. Larva. *J. Marten,* (as A. phalerata.) Trans. Dept. Agr. Ill., vol. 18. Append., p. 115.
1880. Larva. *Coquillett,* (as A. phalerata.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 171.
1885. Egg, larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 460.
FOOD PLANTS. *Gramineæ, etc.*

Arctia celia. Saunders.
1870. Larva. *Saunders.* Canad. Entom., vol. 2, p. 74.

Arctia virguncula. Kirby.
1881. Larva. *Coquillett.* Papilio, vol. 1, p. 7.
FOOD PLANT. *Polygonum.*

Arctia decorata. Saunders.
1881. Larva. *French.* Papilio, vol. 1, p. 81.

Arctia placentia. Abb.-Sm.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 129, pl. 65.

Arctia arge. Drury.

1796. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 125, pl. 63.
1837. Larva. *Westwood,* (quotes Abb.–Sm.) in Drury. Illus. Exot. Entom., vol. 1, p. 34.
1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 244.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 265.
1854. Larva, pupa, (figs.) *Emmons.* Nat. Hist. N. York, vol. 5, pl. 41.
1858. Larva, (col'd fig.) *Duncan.* Natural. Library, vol. 22, p. 175.
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 346.
1862. Larva. *Morris,* (quotes Duncan.) Synop. Lep. N. Amer., p. 340.
1863. Larva. *Saunders.* Canad. Jour., new series, vol. 8, p. 355, (as A. dione.)
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 168.
1869. Larva. *Harris.* Entom. Corres., p. 286.
1872. Larva. *Lintner.* 26th Rept. N. Y. State Cab. N. Hist., p. 143.
1873. Larva. *Stretch,* (quotes Harris.) Zygæn. Bombyc. N. Amer., p. 225.
1874. Larva. *Peabody.* Canad. Entom., vol. 6, p. 98.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 182.
1877. Egg, larva. *W. V. Andrews.* Psyche, vol. 2, p. 79.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 115.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 170.

FOOD PLANT. *Œnothera biennis.*

Arctia brucei. Hy. Edwards.

1888. Larva. *D. Bruce.* Entom. Amer., vol. 3, p. 219.

FOOD PLANTS. *Polygonum, Plantago.*

Arctia remissa. Hy. Edwards.

1888. Egg, young larva. *Hy. Edwards.* Entom. Amer., vol. 3, p. 184.

NOTE. The food plants of the species of Arctia are not always given, as the caterpillars are almost omnivorous, feeding upon any kind of herbaceous plants.

Kodiosoma nigra. Stretch.

1873. Larva, (brief.) *Stretch.* Zygæn. Bombyc. N. Amer., p. 68.

Seirarctia echo. Abb.–Sm.

1797. Larva, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 135, pl. 68.

Seirarctia clio. Packard.

1882. Larva, cocoon. *Behr.* Papilio, vol. 2, p. 187.

FOOD PLANT. *Apocynum.*

Pyrrharctia isabella. Abb.–Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, pl. 66.
1840. Larva. *P. H. Gosse.* Canad. Naturalist, pp. 78, 308.

1880. Larva, cocoon, pupa, (figs.) *Coquillett.* Loc. cit., 169.
FOOD PLANTS. Various low herbs.

Phragmatobia rubricosa. Harris.
1840. Larva, (brief.) *P. H. Gosse.* Canad. Naturalist, p. 195, (as P. fuliginosa.)
1883. Larva, cocoon, pupa. *Edwards—Elliot.* Papilio, vol. 3, p. 127.
1887. Young larva. *Hy. Edwards.* Entom. Amer., vol. 3, p. 68.
FOOD PLANTS. *Solidago, Eupatorium, Symplocarpus.*

Antarctia vagans. Boisd.
1874. Larva, pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc., February.
FOOD PLANT. *Pteris.*

Antarctia punctata. Packard.
1873. Larva, cocoon. *Stretch.* Zygæn. Bombyc. N. Amer., p. 194.
FOOD PLANT. *Lupinus.*

Leucarctia acræa. Drury.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, pl. 67.
1823. Larva, pupa, (figs.) *Harris.* Massachusett's Agr. Reposit., p. 322.
1841. Larva, pupa, (figs.) *Harris.* Ins. Inj. Vegetat., 1st edit., p. 249.
1852. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 269.
1854. Larva. *Emmons.* Nat. Hist. N. York, vol. 5, p. 226.
1858. Larva, pupa, (fig.) *Duncan.* Natural Library, vol. 22, p. 172, pl. 20.
1862. Larva. *Harris.* Ins. Inj Vegetat., Flint's edit., p. 351.
1862. Larva. *Morris.* Synop. Lep. N Amer., p. 312.
1863. Larva. *Saunders.* Canad Jour, new series, vol. 8, p. 363.
1867. Larva, pupa, (figs.) *S. Tenney.* Manual N. Hist., p. 398, pl. 294.
1874. Young larva. *Hy. Edwards.* Proc Cal Acad. Sc., September.
1873. Larva, (col'd figs.) *Stretch.* Zygæn. Bombyc., p. 101, pl. 10.
1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 79.
1877. Larva. *French.* Loc. cit., p. 183.
1879. Larva, pupa, (figs.) *Mrs. Ballard.* Insect Lives, p. 57.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 115.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 170.
FOOD PLANTS. Various low herbs.

Spilosoma virginica. Fabr.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 248.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 268.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York., p. 400.
1862. Larva, (fig. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 349.
1862. Larva. *Morris.* Synop. Lep. N. Amer., p. 344.
1863. Larva. *Saunders.* Canad. Jour., new series, vol. 8, p. 362.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 168.
1869. Larva, cocoon, pupa. *Harris.* Entom. Corres., p. 287.
1871. Larva, pupa, (figs.) *Riley.* 3d Missouri Rept., p. 68.
1871. Larva, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 358.
1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 143.
1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 80.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 183.
1878. Larva, pupa, (figs.) *G. H. Perkins.* 5th Rept. Vermont Board Agr., p. 273.
1879. Larva, cocoon, pupa, (figs.) *Mrs Ballard.* Insect Lives, p. 54.
1880. Larva, pupa. *Saunders.* Canad. Entom., vol. 12, p. 56.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 116.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 169.
1880. Life history (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 21.
1881. Larva, pupa, (figs.) *Packard,* (after Riley.) Ins. Inj. Forest Trees, p. 88.
1883. Life history, (figs.) *Saunders.* Ins. Inj. Fruits, p. 273.
1887. Egg, larva. *D. Bruce,* (melanic var.) Entom. Amer., vol. 3, p. 140.
FOOD PLANTS. Various.

)ilosoma congrua. Walker.

1886. Larva. *G. D. Hulst.* Entom. Amer., vol. 2, p. 15.

)ilosoma vestalis. Packard.

1875. Egg, larval stages. *Hy. Edwards.* Proc. Cal. Acad. Sc., April.

FOOD PLANT. *Lupinus.*

)ilosoma latipennis. Stretch.

1885. Young larva. *G. D. Hulst.* Bull. Brooklyn Entom. Soc., vol. 7, p. 120.

yphantria cunea. Drury. (includ. vars.)

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 139, pl. 70.

1828. Larva. *Harris.* N. Engl'd Farmer, vol. 7, p. 33.

1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 255.

1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 274.

1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 382.

1862. Larva, cocoon, pupa, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 358.

1862. Larva. *Morris*, (quotes Harris.) Synop. Lep. N. Amer., p. 344.

1863. Larva. *Saunders.* Canad. Jour., new series, vol. 8, p. 365.

1869. Larva. *Harris.* Entom. Corres., p. 360.

1870. Larva. *Saunders.* Canad. Entom., vol. 3, p. 36.

1871. Larva, pupa, (figs.) *Riley.* 3d Missouri Rept., p. 130.

1871. Larva, pupa, (figs.) *Bethune.* Rept. Entom. Soc. Ontario, p. 355.

1871. Larva, nest. *Le Baron.* 2d Illinois Rept., p. 18.

1873. Larva. *Saunders.* Canad. Entom., vol. 5, p. 141.

1873. Larva. *Stretch*, (quotes Saunders—Riley.) Zygæn. Bombyc. N. Amer., p. 206.

1873. Larva, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 13.

1875. Larva, pupa, (figs.) *A. J. Cook.* 12th Rept. Michigan Board Agr., p. 152.

1876. Larva. *G. H. Perkins.* 2d Rept. Vermont Board Agr., p. 589.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 185.

1877. Larva, pupa, (figs.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 794.

1879. Larva, pupa, (figs.) *H. Cutting.* Rept. N. Hampshire Board Agr., p. 22.

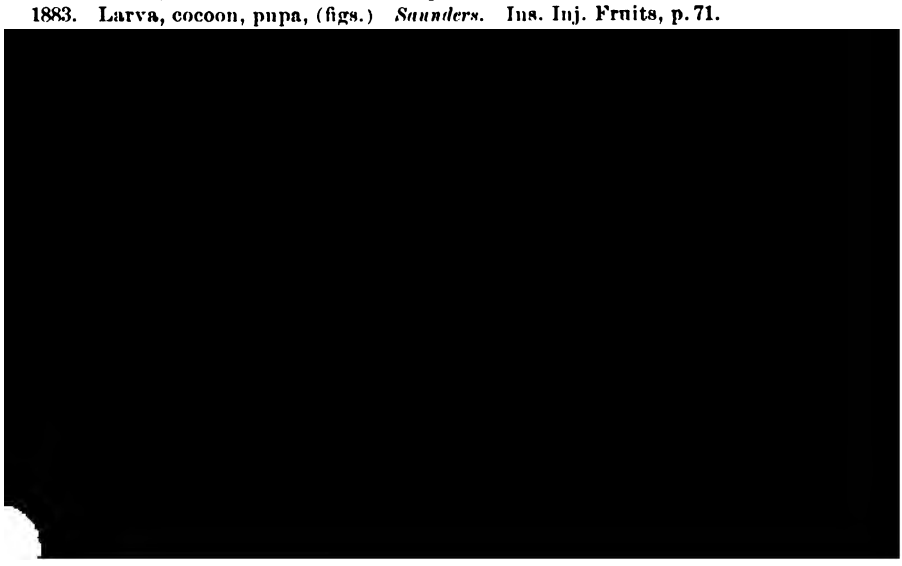
1880. Larva, pupa, (figs.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 116.

1880. Larva, pupa, (figs.) *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 154.

1881. Larva, pupa, (figs.) *Packard*, (quotes Riley.) Ins. Inj. Forest Trees, p. 67.

1883. Larva, (brief.) *N. Coleman.* Papilio, vol. 3, p. 26.

1883. Larva, cocoon, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 71.



1883. Larva. *Hy. Edwards.* Papilio, vol. 3, p. 147.
1884. Egg, larval stages. *French.* Canad. Entom., vol. 16, p. 221.
FOOD PLANTS. Various species of *Asclepias.*

Euchætes egleneusis. Clemens.
1883. Larva. *Hy Edwards.* Papilio, vol. 3, p. 147.
FOOD PLANT. *Asclepias tuberosum.*

Euchætes collaris. Fitch.
1877. Larva. *G. H. Van Waggen.* Canad. Entom., vol. 9, p. 170.
1878. Larva, pupa. *W. H. Patten.* Psyche, vol. 2, p. 251.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 169.
1880. Life history. *H. S. Jewett.* Canad. Entom., vol. 12, p. 228.
1883. Larval stages. *Hy. Edwards.* Papilio, vol. 3, p. 146.
FOOD PLANTS. *Apocynum, Asclepias.*

Arachnis aulea. Boisd.
1883. Larva, pupa. *W. Schaus, jr.* Papilio, vol. 3, p. 188.
FOOD PLANTS. Various low herbs.

Arachnis picta. Packard.
1873. Larva, pupa. *Stretch.* Zygæn. Bombyc. N. Amer., p. 84, pl. 10.
FOOD PLANT. *Lupinus.*

Ecpantheria scribonia. Stoll.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 137, pl. 69.
1841. Larva. *Harris,* (quotes Abb.–Sm.) Ins. Inj. Vegetat., 1st edit., p. 247.
1858. Larva. *Duncan.* Natural. Library, vol. 22, p. 169.
1862. Larva. *Morris,* (quotes Duncan.) Synop. Lep. N. Amer., p. 347.
1863. Larva. *Saunders.* Proc. Entom. Soc. Philad., vol. 2, p. 28.
1863. Larva. *Saunders.* Canad. Jour., new series, vol. 8, p. 370.
1872. Larva, pupa, (fig.) *Riley.* 4th Missouri Rept., p. 141.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 184.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 116.
1882. Larva, (fig.) *Saunders.* Canad. Entom., vol. 14, p. 113.
1882. Larva, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 15.
FOOD PLANTS. *Helianthus, Plantago, Salix.*

Ecpantheria reducta. Gr.
1887. Larva. *D. Bruce.* Entom. Amer., vol. 3, p. 14.
FOOD PLANTS. *Taraxacum, Stellaria, etc.*

Halisidota tesselata. Abb.–Sm. (incl. vars.)
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 149, pl. 75.
1840. Larva, cocoon. *P. H. Gosse.* Canad. Naturalist, p. 293.
1841. Larva, pupa. *Harris,* (quotes Abb.–Sm.) Ins. Inj. Vegetat., 1st edit., p. 259.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 280.
1862. Larva. *Morris,* (quotes Harris.) Synop. Lep. N. Amer., p. 349.
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 361.
1863. Larva. *Saunders.* Canad. Jour., new series, vol. 8, p. 367.
1863. Larva. *B. D. Walsh.* Proc. Boston Soc. N. Hist., vol. 9, p. 289.
1864. Larva. *B. D. Walsh.* Proc. Entom. Soc. Philad., vol. 3, p. 413.
1864. Larva. *B. D. Walsh.* Proc. Entom. Soc. Philad., vol. 3, p. 430.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 116.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 168.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 460.
FOOD PLANT. *Acer.*

Halisidota caryæ. Harris.
1841. Larva, pupa. *Harris.* Ins. inj. Vegetat., 1st edit., p. 258.
1852. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 279.
1854. Larva, pupa, (figs.) *Fitch.* 1st Rept. Ins. N. York, p. 160.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 458.

1862. Larva, cocoon, (col'd figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 361, pl. 6.
1862. Larva. *Morris,* (quotes Harris.) Synop. Lep. N. Amer., p. 348.
1863. Larva. *Saunders.* Canad. Jour., new series, vol. 8, p. 368.
1869. Larva. *Harris.* Entom. Corres., p. 289.
1872. Cocoon. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 148.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 168.
1881. Larva. *Packard,* (quotes Fitch.) Ins. Inj. Forest Trees, p. 76.
FOOD PLANTS. *Carya, Juglans, etc.*

Halisidota maculata. Harris, (incl. vars.)
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 259.
1852. Larva, (brief.) *Harris.* Ins. Inj. Vegetat., 2d edit., p. 279.
1862. Larva, (brief.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 363.
1863. Larva. *Saunders.* Canad. Jour., new series, vol. 8, p. 369.
1869. Larva, (fig.) *Harris.* Entom. Corres., p. 290, pl. 9.
1869. Larva. *Packard.* Guide to Study of Ins., p. 287.
1871. Larva. *Saunders.* Canad. Entom., vol. 3, p. 186.
1873. Larva, cocoon, (col'd figs.) *Stretch.* Zygæn. Bombyc. N. Amer., p. 103, pl. 10.
1876. Larva, cocoon. *Hy. Edwards.* Proc. Cal. Acad. Sc., November.
1881. Larva. *Packard,* (quotes Saunders.) Ins. Inj. Forest Trees, p. 46.
FOOD PLANTS. *Salix, Populus, etc.*

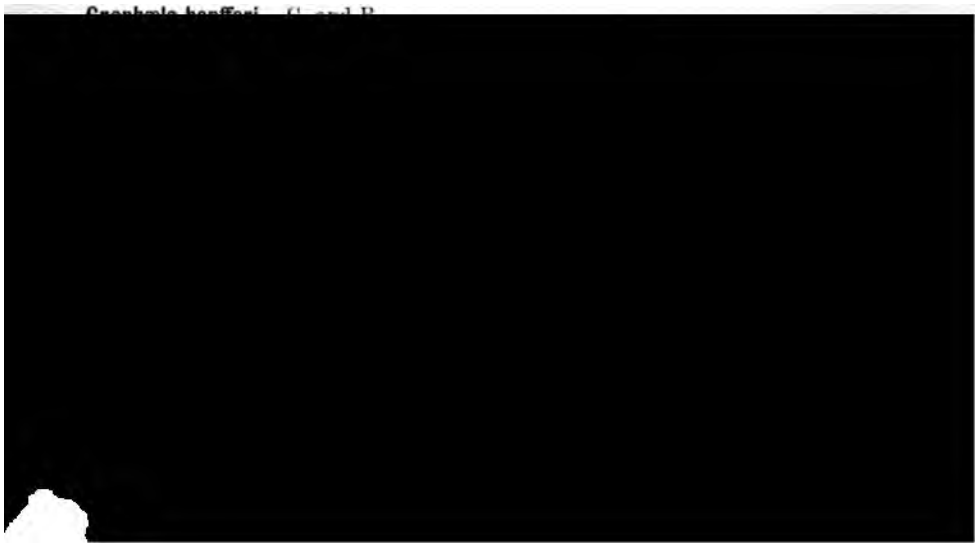
Halisidota argentata. Packard.
1874. Larva, cocoon, pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc., September.
FOOD PLANTS. *Pinus, Abies.*

Halisidota sobrina. Stretch.
1874. Larva, pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc., September.
1887. Larva, (brief.) *J. Fletcher.* Rept. Entom. Dept. Agr. Canad., p. 34.
FOOD PLANT. *Pinus.*

Halisidota edwardsii. Packard.
1873. Larva, (col'd fig.) *Stretch.* Zygæn. Bombyc. N. Amer., p. 88, pl. 10.
1875. Egg, young larva. *Hy. Edwards.* Proc. Cal. Acad. Sc., April.
FOOD PLANT. *Quercus.*

Halisidota cinctipes. Grote.
1886. Larva. *Gundlach.* Entom. Cubana, p. 269.
FOOD PLANT. *Hibiscus.*

Sub-fam. **Pericopidæ.**



1862. Larva, cocoon. *Harris*, (as O. antiqua.)Ins. Inj. Vegetat., Flint's edit., p. 369.
1862. Larva. *Morris*, (quotes Harris.) Synop. Lep. N. Amer., p. 250.
1873. Egg, larva. *Hy. Edwards*, (as O. badia.) Proc. Cal. Acad. Sc., November.
1880. Egg. *W. S. B.* Amer. Entom., vol. 1, 2d series, p. 77.
1880. Cocoon. *W. S. B.* Loc. cit., p. 132.
1883. Larva, (brief.) *Hy. Edwards.* Papilio, vol. 3, p. 189.
1883. Egg, larva. *Stretch.* Loc. cit., p. 38.
1887. Egg, larval stages. *Hy. Edwards.* Entom. Amer., vol. 3, p. 146.
FOOD PLANTS. *Rosaceæ, etc.*

Orgyia vetusta. Boisd.
1881. Larva. *Hy. Edwards.* Papilio, vol. 1, p. 60.
FOOD PLANT. *Lupinus.*

Orgyia gulosa. Hy. Edwards.
1881. Larva. *Hy. Edwards.* Papilio, vol. 1, p. 61.
FOOD PLANT. *Quercus.*

Orgyia leucostigma. Abb.–Sm.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 157, pl. 79.
1833. Egg. *B. H. Ives.* Hovey's Gardener's Mag., vol. 1, p. 52.
1841. Larva, pupa. *Harris*, (quotes Abb.–Sm.) Ins. Inj. Vegetat., 1st edit., p. 262.
1852. Egg, larva, cocoon. *Harris*, (quotes Ives in part.) Ins. Inj. Vegetat., 2d edit., p. 284.
1854. Larva, (col'd fig.) *Emmons.* Nat. Hist. N. York, vol. 5, p. 230, pl. 37.
1856. Larva, cocoon, pupa. *Fitch.* 2d Rept. Ins. N. York, p. 210.
1862. Life history, (col'd figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 366, pl. 7.
1862. Larva. *Morris*, (quotes Harris.) Synop. Lep. N. Amer., p. 249.
1864. Larva, (fig.) *Jaeger.* Life N. Amer. Ins., p. 169.
1869. Life history, (figs.) *Riley.* 1st Missouri Rept., p. 144.
1871. Life history, (figs.) *Le Baron*, (after Riley.) 2d Illinois Rept., p. 13.
1871. Egg, larva. *Saunders.* Canad. Entom., vol. 3, p. 15.
1871. Larva, cocoon, pupa, (figs.) *Bethune.* Rept. Entom. Soc. Ontario, p. 354.
1874. Egg, larva, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 19.
1877. Larva, (fig.) *French.* Trans. Dept. Agr. Ill., vol. 15, p. 185.
1880. Larva. *French*, (as O. leucographa.) 6th Rept. S. Ill. Norm. Univ., p. 44.
1880. Larva, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 117.
1880. Larva, (fig.) *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 166.
1881. Larva, cocoon, pupa, (figs.) *Packard*, (after Riley.) Ins. Inj. Forest Trees, p. 239.
1883. Life history, (figs.) *Saunders.* Ins. Inj. Fruits, p. 58.
1885. Life history, (figs.) *Lintner.* 2d Rept. State Entom. N. York, p. 70.
1887. Life history, (figs.) *Riley.* Bull. 10, Div. Entom. U. S. Dept. Agr., pp. 23–28.
1888. Larva, (fig.) *Lintner.* 4th Rept. N. Y. State Entom., p. 48.
FOOD PLANTS. *Acer, Pyrus, Quercus, etc.*

Orgyia definita. Packard.
1888. Larva, notes on. *Lintner.* 4th Rept. N. Y. State Entom., p. 50.

Parorgyia leucophæa. Abb.–Sm.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 155, pl. 78.
1841. Larva. *Harris.* (quotes Abb.–Sm.) Ins. Inj. Vegetat., 1st edit., p. 264.
FOOD PLANT. *Quercus.*

Parorgyia clintonii. S. and R.
1880. Larva. *Coquillett.* Canad. Entom., vol. 12, p. 45.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 165.
FOOD PLANT. *Quercus.*

Parorgyia achatina. Abb.–Sm.

1797. Larva, (col'd fig.) *Abbott—Smith.* Lep. Ins. Georgia, p. 153, pl. 77.

FOOD PLANT. *Quercus.*

Parorgyia parellela. G. and R.

1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 129.

1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 166.

1881. Larva. *Packard,* (quotes Lintner.) Ins. Inj. Forest Trees, p. 204.

1883. Larva. *Saunders.* Ins. Inj. Fruits, p. 179.

1887. Life history. *O. Seiffert.* Entom. Amer., vol. 3, p. 93.

FOOD PLANTS. *Pyrus, Prunus, Æsculus, etc.*

Lagoa crispata. Packard.

1864. Larva, cocoon, pupa. *Packard.* Proc. Entom. Soc. Philad., vol. 3, p. 335.

1866. Larva, (brief.) *B. D. Walsh.* Practical Entom., vol. 1, p. 126.

1869. Larva, (fig.) *Packard.* Guide to Study of Ins., p. 288.

1870. Life history. *Lintner.* 4th Rept. N. York State Cab. N. Hist., p. 138.

1881. Larva, cocoon, (brief.) *Packard.* Ins. Inj. Forest Trees, p. 176.

1885. Larva, (fig.) *Packard.* Amer. Naturalist, vol. 19, p. 714.

FOOD PLANTS. *Ulmus, Myrica, Pyrus, etc.*

Lagoa opercularis. Abb.–Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 105, pl. 53.

1841. Larva. *Harris,* (quotes Abb.–Sm.) Ins. Inj. Vegetat., 1st edit., p. 264.

1856. Larva. *Fitch,* (? crispata.) 3d Rept. Ins. N. York, p. 363.

1876. Larva, (brief.) *Mary E. Murtfeldt.* Canad. Entom., vol. 8, p. 201.

1885. Larva, cocoon, (figs.) *Hubbard.* Ins. Affect. Orange, p. 140.

1888. Life history, (brief,) (figs.) *Lintner,* (quotes Hubbard.) 4th Rept. N. Y. State Entom., p. 51.

FOOD PLANTS. *Citrus, Pyrus, etc.*

Lagoa pyxidifera. Abb.–Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 107, pl. 54.

FOOD PLANTS. *Vaccinium, Quercus, etc.*

Sub-fam. **Cochliopodæ.**

Euclea cippus. Cram. (Querceti. H. Sch.)

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 145, pl. 73.

1841. Larva. *Harris,* (quotes Abb.–Sm.) Ins. Inj. Vegetat., 1st edit., p. 303.

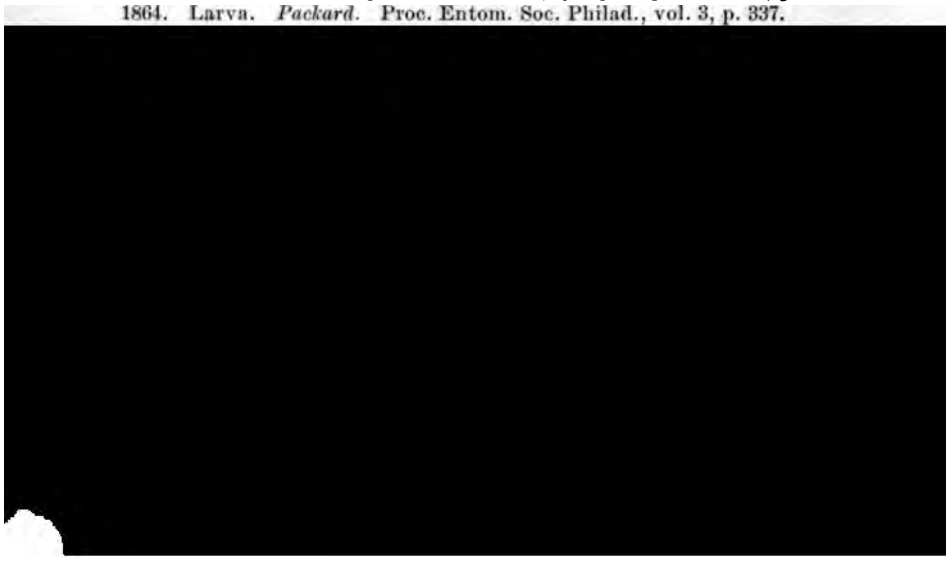
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 323.

1858. Larva, (col'd fig.) *Duncan.* Natural. Library, vol. 22, p. 178, pl. 21.

1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 421.

1862. Larva. *Morris,* (quotes Duncan.) Synop. Lep. N. Amer., p. 126.

1864. Larva. *Packard.* Proc. Entom. Soc. Philad., vol. 3, p. 337.



Nochelia tardigrada. Clem.

1860. Larva. *Clemens.* Proc. Acad. N. Sc. Philad., p. 139.
1862. Larva. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 131.
FOOD PLANT. *Apricot,* (Clemens.)

Empretia stimulea. Clem.

1860. Larva. *Clemens.* Proc. Acad. N. Sc. Philad., p. 139.
1862. Larva. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 130.
1869. Larva, (fig.) *Harris,* (as Lim. ephippiatus.) Entom. Corres., p. 175, pl. 2.
1869. Larva. *Packard.* Guide to Study of Ins., p. 289.
1872. Cocoon. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 149.
1876. Larva. *A. G. Wetherby.* Cincin. Jour. Sc., vol. 2, p. 369.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 187.
1880. Larva. *J. Marten,* (quotes Clemens.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 117.
1883. Larva, cocoon, (figs.) *Saunders.* Ins. Inj. Fruits, p. 113.
1885. Larva, cocoon, (col'd figs.) *H. G. Hubbard.* Ins. Affect. Orange, p. 142.
FOOD PLANTS. *Ulmus, Myrica, Prunus, Citrus, etc.*

Phobetron pithecium. Abb.–Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 147, pl. 74.
1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 301.
1852. Larva, cocoon. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 324.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 381.
1858. Larva, (col'd fig.) *Duncan.* Natural. Library, vol. 22, p. 185, pl. 21.
1862. Larva, cocoon, (fig.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 121.
1862. Larva. *Morris.* Synop. Lep. N. Amer., p. 127.
1872. Cocoon. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 149.
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 47.
1883. Larva, cocoon, (fig.) *Saunders.* Ins. Inj. Fruits, p. 112.
1885. Larva, cocoon, (col'd figs.) *H. G. Hubbard.* Ins. Affect. Orange p. 143
FOOD PLANTS. *Prunus, Quercus, etc.*

Phobetron hyalinum. Walsh.

1863. Larva. *B. D. Walsh.* Proc. Boston Soc. N. Hist., vol. 9, p. 297.
FOOD PLANT. *Prunus.*

Limacodes scapha. Harris.

1852. Larva, (brief.) *Harris.* Ins. Inj. Vegetat., 2d edit., p. 323
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 120
1864. Larva, (brief.) *Packard,* (quotes Shurtleff in lit.) Proc. Entom. Soc. Philad., vol. 3, p. 311.
1869. Larva, (fig.) *Harris.* Entom. Corres., pp. 176, 329, pl. 4
1873. Larva. *Stretch.* (quotes Harris.) Zygæn. Lepidop. N. Amer., p. 201
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 71
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 130
1885. Larva, (col'd fig.) *H. G. Hubbard.* Ins. Affect. Orange, p. 141
FOOD PLANTS. *Prunus, Myrica, Ulmus, Pyrus, Celtis, etc.*

Limacodes biguttata. Packard.

1873. Cocoon. *Stretch.* Zygæn. Lepidop. N. Amer., p. 202

Limacodes fasciola. H. Edw.

1860. Larva. *Clemens.* Proc. Acad. N. Sc. Philad., p. 139.
1862. Larva. *Morris.* (quotes Clemens.) Synop. Lep. N. Amer., p. 130.
1872. Larva. *Brief.* Lintner, 26th Rept. N. York State Cab. N. Hist., p. 147.
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 71.
1883. Larva. *Saunders.* Ins. Inj. Fruits, p. 111.
FOOD PLANT. *Acer.*

NOTE.—These descriptions are very [illegible] distinct species.—H. E.

Sisyrosea inornata. G. and R.

1887. Larva. *G. D. Hulst.* Entom. Amer., vol. 3, p. 66.
1889. Larva. *H. G. Dyar.* Canad. Entom., vol. 21, p. 77.
FOOD PLANT. *Myrica cerifera.*

Adoneta spinuloides. H. Sch.

1860. Larva. *Clemens.* Proc. Acad. Sc. Philad., p. 168.
1862. Larva. *Morris,* (quotes Clemens.) Synop. Lep. N. Amer., p. 129.
1882. Larva, *Mrs. Ballard.* Papilio, vol. 2, p. 83.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 129.
FOOD PLANT. *Prunus, etc.*

Packardia fusca. Packard.

1864. Cocoon, pupa. *Packard.* Proc. Entom. Soc. Philad., vol. 3, p. 343.

Kronæa minuta. Reakirt.

1864. Larva, pupa. *T. Reakirt.* Proc. Entom. Soc. Philad., vol. 3, p. 251.

Sub-fam. **Psychidæ.**

Psyche confederata. Grote and Rob.

1868. Larval case, (fig.) *Grote—Robinson.* Trans. Amer. Entom. Soc., vol. 2, p. 191, pl. 3.
1885. Larval case, (fig.) *H. G. Hubbard.* Ins. Affect. Orange, p. 148.
1887. Larva, pupa. *Hy. Edwards.* Entom. Amer., vol. 3, p. 168.

Psyche fragmentella. Hy. Edwards.

1876. Larval case. *Hy. Edwards.* Proc. Cal. Acad. Sc., November.

Psyche coniferella. Hy. Edwards.

1876. Larval case. *Hy. Edwards.* Proc. Cal. Acad. Sc., November.

Platœceticus gloveri. Packard.

1869. Larva, case, pupa, (figs.) *Packard.* Guide to Study of Ins., p. 291.
1883. Larva, case, pupa, (figs.) *Saunders,* (after Packard.) Ins. Inj. Fruits, p. 380.
1885. Case, pupa, (figs.) *H. G. Hubbard.* Ins. Affect. Orange, p. 149.
FOOD PLANT. *Citrus.*

Thyridopteryx ephemeræformis. Haworth.

1853. Larva, case. *Harris.* Downing's Horticult., vol. 8, p. 461, (as Oik. coniferarum.)
1855. Larva, case, pupa. *T. Glover.* Trans. N. York State Agr. Soc., p. 79.
1859. Larva, case. *P. H. Gosse.* Letters from Alabama, p. 283.
1864. Case. *Packard.* Proc. Entom. Soc. Philad., vol. 3, p. 351.
1866. Larva, case. *B. D. Walsh.* Practical Entom., vol. 2, pp. 22, 84.
1866. Larva, case. *S. S. Rathvon.* Loc. cit., p. 53.

Thyridoptery meadii. Hy. Edwards.

1881. Larval case. *Hy. Edwards.* Papilio, vol. 1, p. 116.

Oiketicus abbotii. Grote.

1880. Larva, case. *Grote.* N. Amer. Entom., p. 52.

1885. Life history, (figs.) *H. G. Hubbard* Ins. Affect. Orange, p. 144, pl. 12.

FOOD PLANTS. *Citrus, etc.*

Oiketicus davidsonii. Hy. Edwards.

1876. Larval case, pupa, (figs.) *Hy. Edwards.* Proc. Cal. Acad. Sc., November.

Perophora meisheimeri. Harris.

1841. Larva, case, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 301.

1852. Larva, case, pupa. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 319.

1862. Larva, case, pupa, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 415, pl. 6.

1869. Larva, case, pupa. *Harris.* Entom. Corres., p. 151.

1869. Larva, case. *Packard.* Guide to Study of Ins., p. 292.

1880. Larva, case. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 156.

FOOD PLANT. *Quercus.*

Sub-fam. **Notodontidæ.**

Ichthyura inclusa. Hübn.

1797. Larva, (col'd fig.) *Abbot—Smith,* (as Clos. anastomosis.) Lep. Ins. Georgia, p. 143, pl. 72.

1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 314.

1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 333.

1858. Larva. *Fitch.* 5th Rept. Nox. Ins. N. York, p. 845.

1862. Life history, (col'd figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 431.

1869. Larva, (fig.) *Harris.* Entom. Corres., p. 310, pl. 3.

1881. Larva, pupa. *Packard,* (quotes Harris.) Ins. Inj. Forest Trees, p. 122.

1883. Young larva. *Hy. Edwards.* Papilio, vol. 3, p. 24.

FOOD PLANT. *Populus.*

Ichthyura ornata. S. and R.

1885. Life history. *French.* Canad. Entom., vol. 17, p. 248.

FOOD PLANT. *Salix.*

Ichthyura palla. French.

1882. Larva. *French.* Canad. Entom., vol. 14, p. 34.

1885. Life history. *French.* Canad. Entom., vol. 17, p. 41.

FOOD PLANT. *Salix.*

Ichthyura albosigma. Fitch.

1855. Egg, larva, cocoon. *Fitch.* 2d Rept. Ins. N. York, p. 274.

1858. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 844.

1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 122.

FOOD PLANT. *Populus.*

Apatelodes torrefacta. Abb.-Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 151, pl. 76.

1864. Larva, (brief.) *Packard.* Proc. Entom. Soc. Philad., vol. 3, p. 353.

1869. Larva. *Harris.* Entom. Corres., p. 307.

FOOD PLANTS. *Rubus, etc.*

Apatelodes angelica. Grote.

1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 130.

FOOD PLANTS. *Fraxinus, Syringa.*

Datana ministra. Drury.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 161, pl. 81.

1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 312.

1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 332.

1855. Larva, pupa, (figs.) *Fitch.* 2d Rept. Ins. N. York, p. 237.

1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 337.

1862. Larva, (fig.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 429.
1866. Larva. *Grote—Robinson,* (quote Angus in lit.) Proc. Entom. Soc. Philad., vol. 6, p. 11.
1866. Larva. *B. D. Walsh.* Practical Entom., vol. 2, p. 7.
1869. Larva, (fig.) *Harris.* Entom. Corres., p. 308, pl. 2.
1873. Life history, (figs.) *Le Baron.* 4th Illinois Rept., p. 186.
1877. Larva, (fig.) *French.* Trans. Dept. Agr. Ill., vol. 15, p. 189.
1880. Egg, larva, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 119.
1880. Egg, larva, (fig.) *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 167.
1883. Larva, (fig.) *Saunders.* Ins. Inj. Fruits, p. 61.
1888. Life history. *W. Beutenmüller.* Canad. Entom., vol. 20, p. 16.
FOOD PLANTS. *Carya, Juglans.*

Datana angusii. G. and R.
1866. Larva. *Grote—Robinson,* (quote Angus in lit.) Proc. Entom. Soc. Philad., vol. 6, p. 10.
1888. Larva. *W. Beutenmüller.* Canad. Entom., vol. 20, p. 135.
FOOD PLANTS. *Juglans, Carya.*

Datana major. G. and R.
1878. Larva. *W. V. Andrews.* Psyche, vol. 2, p. 272.
1889. Larva. *H. G. Dyar.* Canad. Entom., vol. 21, p. 34.
FOOD PLANT. *Andromeda ligustrina.*

Datana integerrima. G. and R.
1866. Larva. *Grote—Robinson,* (quote Angus in lit.) Proc. Entom. Soc. Philad., vol. 6, p. 13.
1888. Larval stages. *W. Beutenmüller.* Canad. Entom., vol. 20, p. 134.
FOOD PLANTS. *Juglans, Carya, Quercus, etc.*

Datana floridana. Graef.
1881. Larva. *A. Koebele.* Bull. Brooklyn Entom. Soc., vol. 4, p. 21.

Datana drexelii. Hy. Edwards.
1884. Larva. *Hy. Edwards.* Papilio, vol. 4, p. 25.
1886. Life history. *W. Beutenmüller.* Canad. Entom , vol. 20, p. 57.
FOOD PLANTS. *Vaccinium corymbosum, Hamamelis.*

Datana contracta. Walker.
1866. Larva. *Grote—Robinson,* (quote Angus in lit.) Proc. Entom. Soc. Philad., vol. 6, p. 14.
1888. Larval stages. *W. Beutenmüller.* Canad. Entom., vol. 20, p. 134.

Notodonta stragula. Grote.

1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 129.

FOOD PLANT. *Salix.*

Lophodonta angulosa. Abb.-Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 165, pl. 83.

FOOD PLANT. *Quercus.*

Pheosia rimosa. Park.

1882. Larva, pupa. *C. F. Goodhue.* Canad. Entom., vol. 14, p. 73.

FOOD PLANTS. *Salix, Populus.*

Pheosia californica. Stretch.

1873. Larva, (col'd fig.) *Stretch.* Zygæn. Bombyc. N. Amer., p. 117, pl. 10.

Edema albifrons. Abb.-Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 159, pl. 80.

1854. Larva, pupa, (figs.) *Emmons.* Nat. Hist. N. York, vol. 5, p. 242, pl. 37.

1869. Larva. *Harris.* Entom. Corres., p. 304.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 191.

1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 120.

FOOD PLANT. *Quercus.*

Seirodonta bilineata. Packard.

1869. Larva, (fig.) *Harris.* Entom. Corres., p. 201, pl. 1.

1869. Larva, (fig.) *Harris,* (as Gluph. ulmi.) Loc. cit., p. 302, pl. 11.

1886. Larva. *French.* Canad. Entom., vol. 18, p. 49.

FOOD PLANT. *Ulmus.*

Oedemasia concinna. Abb.-Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 169, pl. 85.

1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 309.

1852. Egg, larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 328.

1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 342.

1862. Egg, larva, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 426.

1869. Larva, (fig.) *Harris.* Entom. Corres., p. 303, pl. 1.

1877. Larva. *French,* (quotes Harris.) Trans. Dept. Agr. Ill., vol. 15, p. 190.

1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 120.

1881. Life history. *Saunders.* Canad. Entom., vol. 13, p. 138.

1882. Larva, pupa, (figs.) *Saunders.* 12th Rept. Entom. Soc. Ontario, p. 21.

1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 130.

1883. Larva, pupa, (figs.) *T. J. Edge.* Rept. Agr. Pennsylv., p. 70.

1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 63.

1888. Larva, (fig.) *J. Fletcher.* Rept. Entom. Dept. Agr. Canad., p. 28.

FOOD PLANT. *Salix, Prunus, etc.*

Oedemasai salicis. Hy. Edwards.

1876. Larva, cocoon, pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc., October.

FOOD PLANT. *Salix.*

Dasylophia anguina. Abb.-Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 167, pl. 84.

1869. Larva, (fig.) *Harris.* Entom. Corres., p. 304, pl. 1.

1889. Life history. *H. G. Dyar.* Entom. Amer., vol. 5, p. 55.

FOOD PLANT. *Robinia.*

Coelodasys unicornis. Abb.-Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia., p. 171, pl. 83.

1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 307.

1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 326.

1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 363.

1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 424.

1869. Larva, (fig.) *Harris.* Entom. Corres., p. 302, pl. 11.

1872. Larva. *Lintner.* 26th Rept. State Cab. N. Hist., p. 131.

1874. Larva, (fig.) *Packard,* (quotes Lintner.) Amer. Naturalist, vol. 8, p. 691.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 191.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 120.
1880. Larva. *Coquillett,* (quotes Lintner.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 147.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 181.
1883. Larva, cocoon, (figs.) *Saunders.* Ins. Inj. Fruits, p. 80.
FOOD PLANTS. *Prunus, Pyrus, etc.*

Coelodasys mustelina. Pack.
1886. Larva. *French.* Canad. Entom., vol. 18, p. 92.
FOOD PLANT. *Rosa.*

Coelodasys biguttata. Pack.
1870. Larva, pupa, (figs.) *Packard.* Amer. Naturalist, vol. 4, p. 229.
FOOD PLANT. *Ipomea coccinea.*

Janassa lignicolor. Walker.
1889. Life history. *H. G. Dyar.* Entom. Amer., vol. 5, p. 91.

Heterocampa astarte. Doubl.
1869. Larva. *Harris,* (quotes Doubleday in lit., 1839.) Entom. Corres., p. 132.

Heterocampa unicolor. Pack.
1887. Larva. *Hy. Edwards.* Entom. Amer., vol. 3, p. 168.
FOOD PLANT. *Acer pseudo-plantanus.*

Heterocampa pulverea. G. and R.
1880. Larva. *French.* Canad. Entom., vol. 12, p. 83.
1880. Larva. *French.* 6th Ann. Rept. S. Ill. Normal Univ., p. 44.
1881. Larva. *Packard,* (quotes French.) Ins. Inj. Forest Trees, p. 46.
FOOD PLANT. *Quercus.*

Heterocampa marthesia. Cram.
1884. Larva. *Packard,* (as H. tessela.) Amer. Naturalist, vol. 18, p. 1045.
FOOD PLANT. *Quercus.*

Cerura occidentalis. Lintn.
1881. Larva. *French.* Canad. Entom., vol. 13, p. 144.
FOOD PLANT. *Cerasus.*

Cerura cinerea. Walk.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 130.
FOOD PLANT. *Salix.*

Cerura borealis. Boisd.
1797. Larva, (col'd figs.) *Abbot—Smith,* (as C. furcula.) Lep. Ins. Georgia, p. 141, pl. 71.
1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 305.
1872. Larva, (fig.) *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 151.

1872. Life history, (figs.) *Figuier.* Insect World, p. 216.
1872. Life history, (figs.) *Riley.* 4th Missouri Rept., p. 75.
1880. Larva, cocoon, (figs.) *Riley.* Amer. Entom , vol. 1, 2d ser., p. 112.
1880. Larva, cocoon, (figs.) *W. C. Wyckoff*, (after Riley.) Loc. cit., pp. 112, 113.
1885. Egg, larva, (figs.) *Fernald.* Kingsley's Stand. N. Hist., vol. 2, pp. 434, 460.
1886. Life history, (figs.) *Riley.* Dept. Agr. Bull. No. 9.

FOOD PLANTS. *Osage Orange, Rubus, etc.*, (Morris.)

Actias luna. L.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 95, pl. 48.
1837. Larva. *Westwood*, (quotes Abb.–Sm.) in Drury Ill. Exot. Entom., vol. 1, p. 45.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 277.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 297.
1854. Larva, pupa, (col'd figs.) *Emmons.* Nat. Hist. N. York, vol. 5, p. 233, pl. 39.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 452.
1859. Larva, cocoon. *Clemens.* Jour. Acad. Sc. Philad., July.
1862. Larva. *Morris.* Synop. N. Amer. Lep., p. 225.
1862. Larva, cocoon. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 382.
1865. Cocoon, (brief.) *Grote.* Amer. Entom., p. 13.
1867. Larva. *Tenney.* Nat. Hist., p. 401.
1869. Egg. *Minot.* Canad. Entom., vol. 2, p. 27.
1869. Larva, (fig.) *Harris.* Entom. Corres., p. 293, pl. 4.
1872. Life history, (figs.) *Riley.* 4th Missouri Rept., p. 123.
1872. Egg, larval stages. *Lintner.* 26th Rept. N. York State Cab. N. Hist. p. 126.
1874. Larva, (fig.) *J. G. Wood.* Insects Abroad, p. 674.
1874. Larva. *Gentry.* Canad. Entom., vol. 6, p. 86.
1875. Life history. *R. V. Rogers.* Canad. Entom., pp. 141–199.
1875. Egg, larva, cocoon. *R. V. Rogers.* Rept. Entom. Soc. Ontario, p. 43.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 192.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 124.
1880. Larva, (fig.) *Coquillett*, (quotes Lintner.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 178.
1881. Larva, (brief.) *Packard.* Ins. Inj. Forest Trees, p. 76.
1882. Larva, brief, (fig.) *J. A. Moffat.* Rept. Entom. Soc. Ontario, p. 29.
1885. Egg, larva, cocoon. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 458.

FOOD PLANTS. *Juglans, Liquidambar, Betula, Fagus, etc.*

Telea polyphemus. Cramer.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 93, pl. 47.
1840. Larva, (fig.) *P. H. Gosse.* Canad. Naturalist, p. 309.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 278.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 298.
1854. Larva. *Emmons.* Nat. Hist. N. York, vol. 5, p. 236.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 155.
1859. Larva, cocoon. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva. *Morris.* Synop. Lep. N. Amer., p. 226.
1862. Larva, cocoon. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 384.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 159.
1872. Life history, (figs.) *Riley.* 4th Missouri Rept., p. 125.
1872. Egg. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 152.
1874. Larva. *Gentry.* Canad. Entom., vol. 6, p. 86.
1875. Life history, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 41.
1879. Larva, cocoon, pupa, (figs.) *Mrs. Ballard.* Insect Lives, p. 45.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18., Append., p. 124.

1880. Larva. *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 176.
1881. Larva, (fig.) *Packard.* Ins. Inj. Forest Trees, p. 47.
1882. Larva, (figs.) *Saunders.* Canad. Entom., vol. 14. p. 41.
1882. Larva, cocoon, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 15.
1883. Larva, cocoon, pupa, (figs.). *Saunders.* Ins. Inj. Fruits, p. 171.
1885. Egg, larva. *Fernald.* Kingsley's Stand. Nat. Hist., vol. 2, p. 457.
FOOD PLANTS. *Juglans, Tilia, Ulmus, Acer, Pyrus, Rosa, Prunus, etc.*

Attacus cinctus. Tepper.
1884. Cocoon. *Miss Murtfeldt.* Canad. Entom., vol. 16, p. 131.

Attacus yama-mai (domesticated).
1872. Life history, (figs.) *Riley.* 4th Missouri Rept., p. 130.
FOOD PLANTS. *Fagus, Pyrus, Castanea, Photinia, etc.*

Attacus cynthia. Drury.
1837. Larva, cocoon, pupa. *Westwood.* Drury's Ill. Exot. Entom., vol. 2, p. 13.
1858. Larva, (col'd fig.) *Duncan.* Natural. Library, p. 143.
1863. Larva, (fig.) *J. G. Wood.* Ill. Nat. Hist., p. 533.
1872. Egg, larva, cocoon. *Figuier.* Insect World, p. 247.
1872. Life history, (figs.) *Riley.* 4th Missouri Rept., p. 112.
1880. Life history, (figs.) *Riley.* Amer. Entom., vol. 1, 2d series, p. 56.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 125.
1885. Egg, larva, (figs.) *Fernald.* Kingsley's Stand. Nat. Hist., vol. 2, p. 457.
FOOD PLANTS. *Ailanthus, Castor-bean.*

Callosamia promethea. Drury.
1797. Larva, (col'd figs.) *Abbot—Smith.* Lep. Ins. Georgia, p. 91, pl. 46.
1833. Larva, cocoon, pupa, (figs.) *Peale.* Lep. Americana, pl. 3.
1837. Larva, cocoon. *Westwood,* (quotes Peale). Drury's Ill. Exot. Entom., vol. 2, p. 21.
1838. Larva, cocoon, pupa, (figs.) *Westwood,* (quotes Peale.) Introd. Entom., p. 402.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 281.
1852. Larva, cocoon. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 300.
1854. Egg, larva. *Emmons.* Nat. Hist. N. York, vol. 5, p. 238.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 377.
1858. Larva, cocoon, pupa, (figs.) *Duncan.* Natural. Library, vol. 22, p. 136.
1859. Larva, cocoon. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Egg, larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 391.
1862. Larva. *Morris.* Synop. N. Amer. Lep., p. 124.
1864. Egg, larva, cocoon. *Jaeger.* Life N. Amer. Ins., p. 162.
1867. Larva, cocoon. *Tennen.* Nat. Hist., p. 401.

1852. **Larva.** *Harris.* Ins. Inj Vegetat., 2d edit., p. 299.
1854. **Larva,** (col'd fig.) *Emmons.* Nat. Hist. N. York, vol. 5, p. 237, pl. 44.
1856. **Larva.** *Fitch.* 3d Rept. Ins. N. York, p. 338.
1858. **Larva.** *Duncan.* Natural. Library, vol. 22, p. 133.
1859. **Larva, cocoon.** *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. **Larva.** *Morris.* Synop. N. Amer. Lep., p. 224.
1862. **Larva, cocoon, pupa,** (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 385.
1864. **Larva, cocoon,** (figs.) *Jaeger.* Life N. Amer. Ins., p. 155.
1867. **Larva, pupa,** (figs.) *Tenney.* Nat. Hist., p. 400.
1869. **Larva.** *Harris.* Entom. Corres., p. 294.
1870. **Egg.** *P. T. Sprague.* Canad. Entom., vol. 2, p. 82.
1871. **Larva, cocoon.** *Saunders.* Canad. Entom., vol. 3, p. 149.
1872. **Egg, young larva.** *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 125.
1872. **Life history,** (figs.) *Riley.* 4th Missouri Rept , p. 103.
1874. **Life history,** (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 24.
1877. **Life history.** *Gentry.* Canad. Entom., vol. 9, p. 41.
1877. **Larva.** *French,* (quotes Harris.) Trans. Dept. Agr. Ill., vol. 15, p. 193.
1879. **Larva, cocoon, pupa,** (figs.) *Mrs. Ballard.* Insect Lives, p. 75.
1880. **Larva,** (fig.) *J. Marten.* Trans. Agr. Dept. Ill., vol. 18, Append., p. 126.
1880. **Larva,** (fig.) *D. Coquillett.* Trans. Agr. Dept. Ill., vol. 18, Append., p. 177.
1881. **Larva,** (fig.) *Packard,* (after Riley.) Ins. Inj. Forest Trees, p. 113.
1881. **Larva, cocoon.** *G. D. Hulst.* Bull. Brooklyn Entom. Soc., vol. 4, p. 57, hybrid between P. cecropia and P. ceanothi.
1883. **Egg, larva, cocoon,** (figs.) *Saunders.* Ins. Inj. Fruits, p. 75.
1885. **Egg, larva.** *Fernald.* Kingsley's Stand. Nat. Hist., vol. 2, p. 456.

FOOD PLANTS. *Pyrus, Prunus, etc.*

Platysamia columbia. Smith.

1871. **Cocoon.** *G. J. Bowles.* Canad. Entom., vol. 3, p. 203.
1878. **Larva,** (col'd fig.) *G. J. Bowles.* Canad. Entom., vol. 10, frontispiece.
1878. **Larva,** (fig.) *F. B. Caulfield.* Canad. Entom., vol. 10, p. 41.
1878. **Life history.** *Fernald.* Canad. Entom., vol. 10, p. 43.
1879. **Larva, cocoon.** *Hage .* Bull. Buffalo Soc. Nat. Hist., p. 201.
1880. **Larva.** *D. Coquillett,* (quotes Caulfield.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 177.

FOOD PLANT. *Larix americana.*

Platysamia gloveri. Strecker.

1878. **Cocoon, pupa.** *E. L. Graef.* Bull. Brooklyn Entom. Soc., vol. 1, p. 75.

Platysamia ceanothi. Behr.

1869. **Larva, cocoon, pupa.** *Boisdural.* Lep. Califor., p. 81.
1874. **Larva, cocoon, pupa.** *Hy. Edwards.* Proc. Cal. Acad. Sc., September.
1876. **Larva, cocoon, pupa.** *Strecker,* (quotes Hy. Edwards.) Lep. Rhopal. et Heteroc., p. 103.
1880. **Larva.** *A. Wailly.* Canad. Entom., vol. 12, p. 227.

FOOD PLANT. *Ceanothus thyrsiflorus.*

Saturnia mendocino. Behrens.

1878. **Egg, larval stages.** *Hy. Edwards.* Proc. Cal. Acad. Sc., January.

FOOD PLANT. *Arctostaphylos tomentosa.*

Saturnia galbina. Clemens.

1868. **Egg, young larva, cocoon, pupa.** *Hy. Edwards.* Entom. Amer., vol. 4, p. 61.

Pseudohazis eglanterina. Bois.

1833. **Larva,** (col'd fig.) *Titian Peale.* Lep. Americana, pl. 2.
1875. **Egg, larva.** *Hy. Edwards.* Proc. Cal. Acad. Sc., April.

FOOD PLANTS. *Rhamnus, Rosa.*

Hemileuca maia. Drury.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 99, pl. 50.
1837. Larva. *Westwood,* (quotes Abb.–Smith). Drury's Ill. Exot. Entom., vol. 2, p. 45.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 285.
1852. Larva. *Harris,* (quotes Abbot.) Ins. Inj. Vegetat., 2d edit., p. 306.
1854. Larva, (col'd figs.) *Emmons.* Nat. Hist. N. York, vol. 5, p. 232, pl. 39.
1858. Larva. *Duncan.* Natural. Library, vol. 22, p. 154.
1859. Larva. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva. *Morris.* Synop. Lep. N. Amer., p. 221.
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 396.
1869. Life history, (figs.) *Lintner.* 23d Rept. N. York State Cab. N. Hist., p. 137.
1873. Life history, (figs.) *Riley.* 5th Rept. Missouri, p. 127.
1873. Egg, larva, pupa, (figs.) *Packard,* (quotes Riley.) Amer. Naturalist, vol. 7, p. 475.
1877. Larva, (fig.) *Packard,* (after Riley.) Half-hours with Insects, p. 86.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 106.
1878. Larva, (brief.) *C. E. Worthington.* Canad. Entom., vol. 10, p. 16.
1880. Larva, pupa, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 127.
1880. Larva, pupa, (fig.) *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18. Append., p. 163.
1885. Larva. *C. T. Goodhue.* Canad. Entom., vol. 17, p. 243.

FOOD PLANT. *Quercus.*

Hemileuca nevadensis. Stretch.

1875. Larva. *Hy. Edwards.* Proc. Cal. Acad. Sc., April.
1888. Larva. *G. D. Hulst.* Entom. Amer., vol. 3, p. 191.

FOOD PLANT. *Salix.*

Hemileuca yavapai.

1880. Larva. *Hy. Edwards.* Entom. Amer., vol. 3, p. 167.

FOOD PLANT. *Prosopis juliflora.*

Hemileuca californica. Wright.

1888. Larva, (brief.) *W. G. Wright.* Canad. Entom., vol. 20, p. 34.

FOOD PLANT. *Salix.*

Hyperchiria io. Fabr.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 97, pl. 49.
1833. Larva, (col'd fig.) *Titian Peale.* Lep. Americana, pl. 6.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 284.

1874. Larva, cocoon, (figs.) *E. B. Reed.* Rept. Entom. Soc. Ontario, p. 11.
1877. Larva, (fig'd.) *Packard,* (after Riley.) Half-hours with Insects, p. 85.
1879. Larva, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 75.
1879. Larva, pupa, (figs.) *Mrs. Ballard.* Insect Lives, p. 87.
1880. Larva, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 127.
1880. Larva, (fig.) *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 169.
1881. Larva, (fig.) *Packard,* (after Riley.) Ins. Inj. Forest Trees, p. 111.
1883. Life history, brief, (figs.) *Saunders.* Ins. Inj. Fruits, p. 210.
1885. Egg, larva, cocoon. *Fernald.* Kingsley's Stand. Nat. Hist., vol. 2, p. 455.
1888. Larva, pupa, (fig.) *A. R. Grote.* 18th Rept. Entom. Soc. Ontario, pp. 73, 74.

FOOD PLANTS. Various trees and shrubs.

Hyperchiria pamina. Neum.

1888. Larval stages. *Hy. Edwards.* Entom. Amer., vol. 4, p. 62.

Coloradia pandora. Blake.

1888. Egg. *Hy. Edwards.* Entom. Amer., vol. 4, p. 61.

Eacles imperialis. Drury.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 109, pl. 55.
1837. Larva, pupa. *Westwood,* (quotes Abb.–Sm.) Drury's Ill. Exot. Entom., vol. 1, p. 17.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 290.
1852. Larval stages. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 308.
1858. Larva, (col'd fig.) *Duncan.* Natural. Library, vol. 22, p. 160.
1858. Larva, (brief.) *Fitch.* 4th Rept. Ins. N. York, p. 742.
1859. Larva, pupa, (brief.) *P. H. Gosse,* (quotes Abb.–Sm.) Letters from Alabama, p. 172.
1859. Larva, pupa. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva, (fig.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 404.
1862. Larva, pupa. *Morris.* Synop. Lep. N. Amer., p. 230.
1870. Egg, larval stages. *Lintner.* 23th Rept. N. York State Cab. N. Hist., p. 150.
1874. Larva. *Gentry.* Canad. Entom., vol. 6, p. 87.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 196.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 121.
1881. Larva. *Packard,* (quotes Harris.) Ins. Inj. Forest Trees, p. 203.

FOOD PLANTS. *Carya, Juglans, etc.*

Citheronia regalis. Fabr.

1797. Larva, (col'd fig.) *Abbot—Smith,* (as Ph. regia.) Lep. Ins. Georgia, p. 121, pl. 61.
1833. Larva, (col'd fig.) *Titian Peale.* Lep. Americana, pl. 5.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 287.
1852. Larval stages. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 309.
1857. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 156.
1858. Larva, (col'd fig.) *Duncan.* Natural. Library, vol. 22, p. 162.
1859. Larva. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Egg, larva, pupa. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 400.
1862. Larva, pupa. *Morris.* Synop. Lep. N. Amer., p. 230.
1869. Larva, pupa. *Harris.* Entom. Corres., p. 297.
1874. Larva, (fig.) *J. G. Wood.* Insects abroad, p. 682.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 196.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 122.
1880. Larva. *D. Coquillett,* (quotes Harris.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 162.
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 76.
1884. Larva, pupa. (brief.) *J. Hamilton.* Canad. Entom., vol. 16.

FOOD PLANTS. Various trees and shrubs.

Citheronia sepulcralis. G. and R.

1865. Larva. *Grote and Robinson.* Proc. Entom. Soc. Philad., vol. 4, p. 496.
1881. Larva. *Packard,* (quotes G. and R.) Ins. Inj. Forest Trees, p. 203.
1887. Larva. *Hy. Edwards.* Entom. Amer., vol. 3, p. 168.
FOOD PLANT. *Pinus.*

Citheronia mexicana. G. and R.

1888. Pupa. *Hy. Edwards.* Entom. Amer., vol. 4, p. 62.

Sphingicampa bicolor. Harris.

1863. Larva, pupa. Proc. Boston Soc. N. Hist., vol. 9, p. 292.
1864. Larva. *B. D. Walsh.* Proc. Entom. Soc. Philad., vol. 3, p. 425.
FOOD PLANT. *Gleditschia.*

Sphingicampa quadrilineata. G. and R.

1888. Pupa. *Hy. Edwards.* Entom. Amer., vol. 4, p. 62.

Anisota stigma. Fabr.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 111, pl. 56.
1841. Larva, pupa. *Harris,* (quotes Abb.–Sm.) Ins. Inj. Vegetat., 1st edit., p. 292.
1859. Larva. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1859. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 824.
1862. Larva, (brief.) *Morris.* Synop. Lep. N. Amer., p. 231.
1869. Larva, (fig.) *Harris.* Entom. Corres., p. 298, pl. 11.
1873. Larva. *Riley.* 5th Missouri Rept., p. 126.
1878. Larva. *W. V. Andrews.* Psyche, vol. 2, p. 272.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 120.
1887. Larva. *A. R. Grote.* Canad. Entom., vol. 19, p. 51.
FOOD PLANTS. Various species of *Quercus.*

Anisota senatoria. Abb.–Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 113, pl. 57.
1837. Larva. *Westwood,* (quotes Abb.–Sm.) Drury's Ill. Exot. Entom., vol. 2, p. 25.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 292.
1852. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 311.
1859. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 823.
1859. Larva. *Clemens.* Jour. Acad. N. Sc. Philad., July.
1862. Larva. *Morris.* Synop. Lep. N. Amer., p. 231.
1862. Larva, pupa, (fig.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 406.
1866. Larva. *B. D. Walsh.* Pract. Entom., vol. 2, p. 7.
1869. Larva, pupa, (fig.) *Harris.* Entom. Corres., pl. 11.
1870. Larva, (fig.) *T. Glover.* Rept. U. S. Dept. Agr., p. 82.

1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 121.
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 45.
1887. Larva. *A. R. Grote.* Canad. Entom., vol. 19, p. 52.
FOOD PLANTS. Various species of *Quercus.*

Dryocampa rubicunda. Fabr.
1864. Larva. *B. D. Walsh,* description by Lintner. Proc. Entom. Soc. Philad., vol. 3, p. 426.
1870. Larva. *Saunders.* Canad. Entom., vol. 2, p. 75.
1870. Larva, (fig.) *T. Glover.* Rept. U. S. Dept. Agr., p. 83.
1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 133.
1873. Life history, (figs.) *Riley.* 5th Missouri Rept., p. 137.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 196.
1879. Larva, pupa, (figs.) *Mrs. Ballard.* Insect Lives, p. 83.
1880. Larva, pupa, (figs.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 121.
1881. Larva, pupa, (figs.) *Packard,* (quotes Riley.) Ins. Inj. Forest Trees, p. 109.
1887. Larva. *A. R. Grote.* Canad. Entom., vol. 19, p. 52.
FOOD PLANTS. *Acer, etc.*

Clisiocampa californica. Park.
1869. Larva, (brief.) *Boisdural,* (as B. pseudoneustria.) Lep. Califor., p. 82.
1877. Larva, cocoon. *Packard,* (quotes Hy. Edwards in lit.) Inj. Ins. West, Hayden's Rept., p. 807.*
1881. Larva, cocoon. *Stretch.* Papilio, vol. 1, p. 64.
1881. Larva. *Packard,* (quotes Stretch.) Ins. Inj. Forest Trees, p. 41.
1881. Larva, cocoon. *Packard,* (quotes Hy. Edwards in lit.) Ins. Inj. Forest Trees, p. 43.*
FOOD PLANTS. *Quercus agrifolia, Rubus, etc.*
*NOTE.—This description was given by me to Dr. Packard in error as Gastropacha californica.—H. E.

Clisiocampa americana. Harris.
1796. Life history, (brief.) *Peck.* Proc. Mass. Agr. Soc.
1797. Larva, (col'd fig.) *Abbot—Smith,* (as B. castrenis.) Lep. Ins. Georgia, p. 119, pl. 60.
1826. Larva. *Harris.* N. Engl'd Farmer, vol. 4, p. 354.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 268.
1843. Larva. *W. Gaylord.* Trans. N. York State Agr. Soc. (prize essay), p. 152.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 286.
1854. Egg, larva, (figs.) *Emmons.* Nat. Hist. N. York, vol. 5, p. 235.
1856. Egg, larva, pupa, (figs.) *Fitch.* 2d Rept. Ins. N. York, p. 185.
1862. Egg, larva, cocoon, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 371.
1862. Larva, (brief.) *Packard.* Rept. Maine Board Agr., p. 170.
1864. Larva. *Jaeger.* Life N. Amer. Insects, p. 171.
1867. Larva, cocoon, (fig.) *Tenney.* Nat. Hist., p. 404, pl. 299.
1869. Larva. *Boisdural,* (as B. frutetorum.) Lep. Califor., p. 82.
1870. Egg, larva. *T. Glover.* Rept. U. S. Dept. Agr., p. 83.
1871. Egg, larva, cocoon, (figs.) *Riley.* 3d Missouri Rept., p. 118.
1872. Egg, larva, cocoon, (figs.) *Saunders.* Canad. Entom., vol. 4, p. 134.
1873. Egg, (fig.) *Riley.* 5th Missouri Rept., p. 56.
1873. Egg, larva, cocoon, (figs.) *A. J. Cook.* 12th Agr. Rept. Michigan, p. 131.
1875. Egg, larva, cocoon, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 30.
1876. Egg, larva, cocoon, (figs.) *G. H. Perkins.* Rept. Vermont Board. Agr., p. 586.
1877. Egg, larva, pupa, (figs.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 793.
1877. Egg, larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 197.
1877. Egg, larva, cocoon, (fig.) *B. Gott.* Rept. Entom. Soc. Ontario, p. 41.
1877. Larva. *Packard.* Half-hours with Insects, p. 172.
1878. Egg. *Saunders.* Canad. Entom., vol. 10, p. 21.

1879. Egg, larva, cocoon, (figs.) *H. Cutting.* N. Hamp. Board Agr., p. 17.
1880. Egg, larva, cocoon, (figs.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 122.
1880. Egg, larva, cocoon, (figs.) *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 155.
1883. Egg, larva, cocoon, (figs.) *Saunders.* Ins. Inj. Fruits, p. 48.
1887. Egg, larva, pupa, (figs.) *J. Fletcher.* Rept. Entom. Dept. Agr. Can., p. 24.
1888. Egg, larva, cocoon, (figs.) *J. Fletcher.* Rept. Bot. Entom. Dept. Agr. Canada, p. 24.
1889. Egg, larva, cocoon, (figs.) *J. Fletcher.* Canad. Entom., vol. 21, p. 74.

FOOD PLANTS. Various trees and shrubs.

Clisiocampa constricta. Stretch.

1874. Larva, cocoon, pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc., September.
1881. Larva, cocoon. *Stretch.* Papilio, vol. p. 65.
1881. Larva. *Packard,* (quotes Hy. Edwards.) Ins. Inj. Forest Trees, p. 41.

FOOD PLANT. *Quercus sonomensis.*

Clisiocampa erosa. Stretch.

1881. Cocoon. *Stretch,* (quotes Hy. Edwards in lit.) Papilio, vol. 1, p. 67.

Clisiocampa disstria. Hübn.—**Sylvatica.** Harris.

1797. Larva, (col'd fig.) *Abbot—Smith,* (as G. neustria.) Lep. Ins. Georgia, p. 117, pl. 59.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 271.
1844. Larva. *Harris.* N. Eng'd Farmer, vol. 22, p. 412.
1852. Larva, cocoon. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 291.
1854. Larva, cocoon, (figs.) *Emmons,* (as B. neustria.) Nat. Hist. N. York, vol. 5, p. 240.
1856. Larva. *Fitch.* 2d Rept. Ins. N. York, p. 198.
1858. Larval stages. *Fitch.* 5th Rept. Ins. N. York, p. 820.
1862. Larva, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 375.
1862. Larva. *Morris,* (quotes Harris.) Synop. N. Amer. Lep., p. 236.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 173.
1869. Larva. *Harris.* Entom. Corres., p. 292.
1871. Egg, larva, (fig'd.) *Riley.* 3d Missouri Rept., p. 121.
1874. Larva, (fig.) *J. G. Wood.* Insects Abroad, p. 680.
1875. Larva, (fig.) *Saunders,* Rept. Entom. Soc. Ontario, p. 30.
1877. Larva. *B. Gott.* Rept. Entom. Soc. Ontario, p. 41.
1877. Egg, larva, (figs.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 794.
1878. Egg, larva, (figs.) *G. H. Perkins.* Rept. Vermont Board Agr., p. 258.

1856. Larva. *Fitch.* 3d Rept. Ins. N. York, pp. 337, 380.
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 377.
1869. Larva. *Harris.* Entom. Corres. p. 292.
1872. Larva. *Lintner.* 26th Rept. N York State Cab. N. Hist., p. 154.
1874. Egg. *H. H. Lyman.* Canad. Entom vol 6, p. 158.
1880. Larva. *D. Coquillett.* Trans Dept. Agr. Ill., vol. 18, Append., p. 166.
1863. Egg, larva, cocoon. *Saunders.* Ins. Inj. Fruits, p. 87.

FOOD PLANTS. *Pyrus, Fraxinus, Quercus.*

Tolype velleda. Stoll.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 103, pl. 52.
1841. Larva, pupa. *Harris.* n Inj. Vegetat., 1st edit., p. 274.
1848. Larva. *Miss Dix.* Silliman's Jour of Sc. and Art, vol. 19, p. 62.
1852. Larva. *Harris.* Ins. Inj Vegetat 2d edit., p. 293.
1856. Larva. *Fitch.* 3d Rept. Ins. N York, p. 338.
1862. Young larva. *Harris* Ins. Inj. Vegetat., Flint's edit., p. 379.
1869. Larva. *Harris.* Entom. Corres., p. 293.
1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 134.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 197.
1880. Larva. *D. Coquillett,* (quotes Lintner.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 166.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 130.
1883. Egg. *Hy. Edwards.* Papilio, vol. 3, p. 189.
1883. Larva, cocoon figs.) *Saunders.* Ins. Inj. Fruits, p. 89.

FOOD PLANTS. *Populus, Prunus, etc.*

Tolype laricis. Fitch.

1856. Life history. *Fitch.* 2d. Rept. Ins. N. York, p. 264.
1881. Larva, cocoon. *Packard,* (quotes Fitch.) Ins. Inj. Forest Trees, p. 254.
1883. Cocoon, (brief.) *H. R. Gilbert.* Papilio, vol. 3, p. 25.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 131.

FOOD PLANT. *Larix americana.*

Sub-fam. **Cossidæ.**

Cossus centerensis. Lintner.

1879. Life history. *Jas. S. Bailey.* Canad. Entom., vol. 11, p. 1.
1880. Larva. *D. Coquillett,* (quotes Bailey.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 151.
1881. Larva, pupa. *Packard,* (quotes Bailey.) Ins. Inj. Forest Trees, p. 120.
1883. Pupa, (brief.) *J. Fletcher.* Canad. Entom., vol. 15, p. 203.
1883. Life history, (col'd figs.) *Jas. S. Bailey.* Bull. U. S. Dept. Agr., No. 3, p. 50.
1885. Pupa, (figs.) *Lintner.* 2d Rept. State Entom. N. York, p. 216.

FOOD PLANT. *Populus tremuloides.*

Cossus alni. Kellicott. (New sp.?)

1885. Larva. *D. Kellicott.* Entom. Amer., vol. 1, p. 175.

Prionoxystus robiniæ. Peck.

1821. Life history (brief,) (figs.) *Peck.* Mass. Agr. Repos. and Jour., vol. 5, p. 67.
1841. Larva pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 296.
1852. Life history. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 316.
1858. Life history. *Fitch.* 5th Rept. Ins. N. York, p. 784.
1862. Larva, pupa, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 411
1877. Larva. *Packard.* Half-hours with Insects, p. 239.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 198.
1880. Larva. *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 152.
1881. Egg, larva, pupa. *Packard.* Ins. Inj. Forest Trees, p. 7.
1881. Larva, pupa, (brief.) *D. Kellicott.* Bull. Buffalo Soc. N. Hist., vol. 4, p. 30.

FEEDS in trunks of *Quercus, Robinia, Populus, Salix, etc.*

Zeuzera æsculi. Linn.

1829. Larva, pupa. *Stephens.* Illust. Brit. Entom., Hawkes, vol. 2, p. 8.
1829. Larva, (fig.) *A. Matthews.* Mag. Nat. Hist., vol. 2, p. 66.
1829. Larva, (fig.) *D. G. Kerridge.* Mag. Nat. Hist., vol. 2, p. 292.
1837. Larva, pupa. *Kollar.* Ins. Inj. Vegetat., London's edit., p. 208.
1839. Larva, (col'd fig.) *Curtis.* Brit. Entom., vol. 16, pl. 722.
1840. Larva, pupa, (col'd figs.) *Ratzeburg.* Die Forst-Insecten, vol. 2, p. 88, pl. 3, 4.
1840. Larva, (brief.) *Westwood.* Intr. Mod. Class. Ins., vol. 2, p. 378.
1857. Larva. *Chenu—Demarets.* Encyc. Hist. Nat. Papillons, vol. 2, p. 44.
1858. Larva, (col'd fig.) *Duncan.* Nat. Library, vol. 30, p. 185, pl. 15.
1859. Larva. *H. T. Stainton.* Brit. Butt. Moths, vol, 1, p. 113.
1859. Larva, (col'd fig.) *Humphreys.* Genera Brit. Moths, vol. 1, p. 15, pl. 4.
1869. Larva. *Newman.* British Moths, p. 18.
1872. Larva, (fig.) *J. G. Wood.* Insects at Home, p. 428.
1879. Egg, larva, pupa, (figs.) *Miss E. A. Ormerod.* Rept. Inj. Ins., p. 23.
1882. Larva, (col'd fig.) *W. F. Kirby.* Europ. Butt. and Moths, p. 113, pl. 26.

FEEDS in trunk and branches of *Quercus, Salix, Populus, etc.*

Cossula magnifica. Bailey.

1882. Life history, (brief.) *J. S. Bailey.* Papilio, vol. 2, p. 94.
1883. Pupa, (col'd fig.) *J. S. Bailey.* Bull. Dept. Agr., No. 3, pl. 2.

FOOD PLANT. *Quercus virens.*

Sub-fam. **Hepialidæ.**

Hepialus argenteomaculatus. Harris.

1840. Egg, (brief.) *P. H. Gosse.* Canad. Naturalist, p. 248.
1888. Larva, notes on. *D. S. Kellicott.* Entom. Amer., vol. 4, p. 153.
1889. Life history. *D. S. Kellicott.* Insect Life, vol. 1, p. 250.

NOCTUÆ.

Bombycia improvisa. Hy. Edwards.

1873. Pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc., November.

Pseudothyatira cymatophoroides. Guen., (and var.)

1863. Larva. *A. R. Grote,* (quotes Cutler in lit.) Proc. Entom. Soc. Philad., vol. 2, p. 134.
1883. Larva. *R. Thaxter.* Papilio, vol. 3, p. 10.

FOOD PLANT. *Quercus.*

Habrosyne scripta. Gosse.

1883. Egg, larva. *R. Thaxter.* Papilio, vol. 3, p. 10.

FOOD PLANT. *Rubus.*

Platycerura furcilla. Packard.

Raphia frater. Grote.

1883. Larva. *R. Thaxter.* Papilio, vol. 3, p. 13.

Apatela grisea. Walker.

1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 131.

FOOD PLANT. *Ulmus.*

Apatela falcula. Grote.

1881. Larva. *D. Coquillett.* Papilio, vol. 1., p. 6.

FOOD PLANT. *Corylus.*

Apatela occidentalis. G. and R.

1869. Larva. *Harris.* Entom. Corres., p. 311.

1872. Larva. *Saunders.* Canad. Entom., vol. 4, p. 49.

1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 129.

1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 83.

1883. Egg, larva, pupa, cocoon. *Saunders.* Ins. Inj. Fruits, p. 166.

FOOD PLANT. *Cerasus.*

Apatela lobeliæ. Guen.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 1, p. 44.

1881. Larva. *D. Coquillett.* Papilio, vol. 1, p. 6.

1886. Larva. *French.* Canad. Entom., vol. 18, p. 118.

FOOD PLANT. *Quercus.*

Apatela morula. G. and R.

1869. Larva, (fig.) *Harris.* Entom. Corres., p. 312, pl. 3, (as A. ulmi.)

1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 137.

1883. Life history. *Thaxter.* Papilio, vol. 3, p. 14.

FOOD PLANT. *Ulmus.*

Apatela vulpina. Grote.

1883. Larva. *Thaxter.* Papilio, vol. 3, p. 14.

FOOD PLANTS. *Betula, Populus.*

Apatela radcliffei. Harvey.

1878. Larva, cocoon, pupa. *Thaxter.* Psyche, vol. 2, p. 121.

FOOD PLANT. *Prunus serotina.*

Apatela spinigera. Guen.

1878. Larva. *Thaxter.* Psyche, vol. 2, p. 121.

FOOD PLANTS. *Rubus, Betula.*

Apatela betulæ. Riley.

1884. Larva, pupa. *Riley.* Bull. Brooklyn Entom. Soc., vol. 7, p. 2.

FOOD PLANT. *Betula nigra.*

Apatela spinea. Gr.

1878. Egg, young larva. *Hy. Edwards.* Proc. Cal. Acad. Sc., June.

FOOD PLANT. *Lupinus.*

Apatela lepusculina. Guen.

1875. Larva. *Hy. Edwards.* Proc. Cal. Acad. Sc., April.

FOOD PLANT. *Populus.*

Apatela populi. Riley.

1870. Larva, pupa, (fig.) *Riley.* 2d Missouri Rept., p. 119.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 201.

1880. Larva, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 130.

1881. Larva, pupa, (fig.) *Packard,* (after Riley.) Ins. Inj. Forest Trees, p. 116.

1882. Larva, (fig.) *Saunders.* Canad. Entom., vol. 14, p. 221.

1883. Larva, (fig.). *Saunders.* Rept. Entom. Soc. Ontario, p. 24.

FOOD PLANT. *Populus.*

NOTE.—The two species (undoubtedly distinct), *A. lepusculina and A. populi,* have been confounded, and some of the descriptions of early stages of the latter have been given under the former name. *A. lepusculina* appears to be confined to the Pacific coast.—H. E.

Apatela felina. Grote.

1887. Larval stages, pupa. *French.* Canad. Entom., vol. 19, p. 49.

FOOD PLANT. *Salix.*

Apatela americana. Harris.

1797. Larva, (col'd fig.) *Abbot—Smith.* as A. aceris. **Lep. Ins. Georgia, p. 185, pl. 93.**

1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 317.

1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 357.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 1, p. 48. as A. aceniola.)

1862. Larva, pupa, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 436.

1869. Larva, (fig.) *Harris.* Entom. Corres., p. 311, pl. 121

1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., pp. 135, 157.

1875. Larva, (brief.) *Grote.* Bull. Buffalo Soc. N. Sc., vol. 2, p. 154.

1877. Larva. *French.* (quotes Harris. Trans. Dept. Agr. Ill., vol. 15, p. 200.

1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 130.

1881. Larva. *D. Coquillett.* Papilio, vol. 1, p. 6.

1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 111.

FOOD PLANT. *Acer.*

Apatela hastulifera. Abb.–Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 183, pl. 92.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 1, p. 47.

1872. Larva, cocoon. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 158

FOOD PLANTS. *Æsculus, Acer.*

Apatela rubricoma. Guen.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 1, p. 48.

1880. Larva. *French.* 6th Rept. Ill. State Norm. Univer., p. 45.

1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 132.

FOOD PLANT. *Celtis crassifolia.*

Apatela luteicoma. G. and R.

1883. Larva. *Thaxter.* Papilio, vol. 3, p. 16.

FOOD PLANTS. *Tilia, Acer, Fraxinus.*

Apatela clarescens. Guen.

1869. Larva, fig. *Harris.* Entom. Corres., p. 313, pl. 4, (as A. pruni.)

FOOD PLANT. *Prunus.*

Apatela hesperia. Guen.

1877. Larva, pupa. *L. W. Goodell.* Canad. Entom , vol. 9, p. 61.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 131.
FOOD PLANT. *Castanea.*

Apatela lithospila. Grote.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 132.
FOOD PLANT. *Carya alba.*

Apatela oblinita. Abb.–Sm.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 187, pl. 94.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 1, p. 49.
1869. Larva, (fig.) *Packard.* Guide to Study of Ins., p. 304.
1871. Larva, pupa, (fig.) *Riley.* 3d Missouri Rept., p. 70.
1871. Larva, (fig.) *Saunders.* Canad. Entom., vol. 3, p. 226.
1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 159.
1877. Larva. *French,* (quotes Riley.) Trans. Dept. Agr. Ill., vol. 15, p. 201.
1878. Larva, pupa, (figs.) *G. H. Perkins,* (after Riley.) 5th Rept. Vermont Board Agr., p. 275.
1878. Larva. *L. W. Goodell.* Canad. Entom., vol. 10, p. 66.
1880. Larva, cocoon, (figs.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 131.
1880. Larva, cocoon, (fig.) *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 170.
1883. Larva, cocoon, pupa, (figs.) *S. A. Forbes.* Trans. Wisconsin Agr. Soc., vol. 21, p. 7.
1883. Larva, cocoon, (fig.) *Saunders.* Ins. Inj. Fruits, p. 325.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 452.
FOOD PLANTS. *Polygonum, Peach, Asparagus, etc.*

Arsilonche albovenosa. Grote. =**henrici.** Gr.
1877. Larva. *Thaxter.* Psyche, vol. 1, p. 188.
1880. Larva. *D. Coquillett.* Canad. Entom., vol. 12, p. 45.
1880. Larva. *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 171.
1888. Larval stages. *Hy. Edwards.* Entom. Amer., vol. 3, p. 171.
FOOD PLANTS. *Polygonum, etc.*

Harrissimemna trisignata. Walk.
1869. Larva, pupa, (fig.) *Harris.* Entom. Corres., pp. 114, 174.
1869. Larva, (fig.) *Packard.* Guide to Study of Ins., p. 304.
1886. Larva. *C. F. Goodhue.* Canad. Entom., vol. 18, p. 58.
FOOD PLANT. *Syringa.*

Agrotis c. nigrum. Linn.
1829. Larva, pupa. *Stephens.* Illus. Brit. Entom., Haust., vol. 2, p. 136.
1859. Larva. *H. T. Stainton.* Brit. Butt., Moths, vol. 1, p. 234.
1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 89.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 202.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 132.
1880. Larva. *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 184.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 192.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 133.

Agrotis baja. S. V.
1829. Larva. *Stephens.* Illus. Brit. Entom., Haust., vol. 2, p. 134.
1859. Larva. *H. T. Stainton.* Brit. Butt., Moths, vol. 1, p. 237.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 191.

Agrotis fennica. Tausch.
1884. Larva. *J. Fletcher.* Canad. Entom., vol. 16, p. 204.

Agrotis subgothica. Haw.
1869. Larva, (fig.) *Riley.* 1st Missouri Rept., p. 81.
1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 89.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 204.

1877. Larva, (fig.) *Packard.* Half-hours with Insects, p. 22.
1879. Larva. *G. J. Bowles.* Rept. Entom. Soc. Ontario, p. 41.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 132.
1881. Larva. *F. W. Chase.* Trans. Wisconsin Agr. Soc., vol. 19, p. 482.
1883. Larva, (brief.) *Saunders.* Ins. Inj. Fruits, p. 328.

Agrotis tricosa. Lintner.

1869. Larva. *Riley.* 1st Missouri Rept., p. 82.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 132.

Agrotis herilis. Grote.

1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 90.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 205.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 133.

Agrotis plecta. Linn.

1829. Larva. *Stephens.* Illus. Brit. Entom., Haust., vol. 2, p. 137.
1859. Larva. *H. T. Stainton.* Brit. Butt., Moths, vol. 1, p. 234.
1882. Larva, (col'd fig.) *W. F. Kirby.* Europ. Butt. and Moths, p. 194, pl. 36.

Agrotis cupida. Grote.

1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 15, Append., p. 136.

Agrotis clandestina. Harris.

1841. Larva. *Harris,* (quotes Melsheimer in lit.) Ins. Inj. Vegetat., 1st edit., p. 325.
1869. Larva, (fig.) *Riley.* 1st Missouri Rept., p. 79.
1871. Larva. *Saunders.* Canad. Entom., vol. 3, p. 35.
1876. *G. H. Perkins.* 2d Rept. Vermont Board Agr., p. 597.
1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 95.
1877. Larva. *French,* (quotes Riley.) Trans. Dept. Agr. Ill., vol. 15, p. 213.
1877. Larva. *Packard.* Inj. Ins. West, Hayden's Rept., p. 717.
1877. Larva, (fig.) *Packard.* Half-hours with Insects, p. 23.
1879. Larva, (fig.) *G. J. Bowles,* (quotes Riley.) Rept. Entom. Soc. Ontario, p. 44.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 135.
1883. Larva, (brief), (fig.) *Saunders.* Ins. Inj. Fruits, p. 108.
1884. Larva, (brief), (fig.) *Riley.* Rept. Entom. U. S. Dept. Agr., p. 293, pl. 2, fig. 4.
1885. Larva, (fig.) *Lintner.* 44th Rept. N. York State Agr. Soc., p. 57.
1888. Larva, (fig.) *Lintner.* Bull. N. Y. State Museum, No. 6, p. 4.

Agrotis messoria. Harris.

1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 92.
1877. Larva, (fig.) *French.* Trans. Dept. Agr. Ill., vol. 15, p. 209.

1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 91.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 206.
1879. Larva. *G. J. Bowles,* (quotes Fitch.) Rept. Entom. Soc. Ontario, p. 39.
1879. Larva. *W. A. Burkhou.* Agr. Pennsylv., p. 34.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 133.

Agrotis declarata. Walker.

1885. Larva. *Saunders.* Canad. Entom., vol. 17, p. 32.

Agrotis malefida. Guen.

1884. Life history, (fig.) *Riley.* Rept. Entom. U. S. Dept. Agr., p. 292, pl. 1, fig. 3.
1888. Larva, (fig.) *Lintner.* Bull. N. Y. State Museum, No. 6, p. 14.

Agrotis cochranii. Riley.

1869. Life history, (fig.) *Riley.* 1st Missouri Rept., p. 74.
1869. Larva. *Packard.* Guide to Study of Ins., p. 308.
1873. Larva, pupa, (figs.) *A. J. Cook.* 12th Rept. Michigan State Board Agr., p. 110.
1877. Larva, (fig.) *Packard.* Half-hours with Insects, p. 23.
1883. Larva, pupa, (brief.) *Saunders.* Ins. Inj. Fruits, p. 107.
1888. Larva, (fig.) *Bethune.* 18th Rept. Entom. Soc. Ontario, p. 57.

Agrotis annexa. Tr.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 1, p. 268.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 136.
1882. Life history. *French.* Canad. Entom., vol. 14, p. 207.
1884. Life history, (fig.) *Riley.* Rept. Entom. U. S. Dept. Agr., p. 291, pl. 2, fig. 1.
1885. Larva, pupa, (figs.) *Lintner.* 44th Rept. N. York State Agr. Soc., p. 62.
1888. Larva, pupa, (fig.) *Lintner.* Bull. N. Y. State Museum, No. 6, p. 12.

Agrotis ypsilon. Rott. = **suffusa.** S. V.

1829. Larva. *Stephens.* Illus. Brit. Entom., Haust., vol. 2, p. 149.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 223.
1869. Larva, (fig.) *Riley.* 1st Missouri Rept., p. 80.
1869. Larva, (fig.) *Packard.* Guide to Study of Ins., p. 306.
1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 93.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 210.
1877. Larva, (figs.) *Packard,* (quotes Riley.) Inj. Ins. West, Hayden's Rept., p. 717.
1879. Larva. *G. J. Bowles.* Rept. Entom. Soc. Ontario, p. 40.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 134.
1883. Larva, (fig.) *Saunders.* Ins. Inj. Fruits, p. 327.
1884. Egg, larva, (fig.) *Riley.* Rept. Entom. U. S. Dept. Agr., p. 291, pl. 2, fig. 2.
1888. Larva, (fig.) *Lintner.* Bull. N. Y. State Museum, No. 6, p. 15.
1888. Larva, (fig.) *Bethune.* 18th Rept. Entom. Soc. Ontario, p. 57.

Agrotis islandica. Standgr.

1873. Larva. *Packard.* In Hayden's Geol. Surv. Terr., p. 556.

Agrotis saucia. Hübn.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 224.
1869. Life history, (figs.) *Riley.* 1st Missouri Rept., p. 72.
1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 94.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 211.
1879. Larva. *G. J. Bowles,* (quotes Riley.) Rept. Entom. Soc. Ontario, p. 41.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 134.
1880. Larva, (brief.) *Riley.* Amer. Entomologist, 2d series, vol. 1, p. 298.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 194.
1884. Life history, (brief.) *Riley.* Rept. Entom. U. S. Dept. Agr., p. 297, pl. 3, figs. 1, 2.

1885. Egg, (fig.) *Lintner.* 44th Rept. N. York State Agr. Soc., p. 59.
1885. Egg, larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 452.
1888. Egg, larva, (figs.) *Lintner.* Bull. N. Y. State Museum, No. 6, pp. 8, 16.

Agrotis lubricans. Guen.

1880. Larva. *French.* Canad. Entom., vol. 12, p. 14.
1880. Larva. *French.* 6th Rept. Ill. Norm. Univer., p. 45.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 135.

Agrotis prasina. Fabr.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 271.

Agrotis occulta. Hübn.

1829. Larva. *Stephens.* Ill. Brit. Entom., Haust., vol. 3, p. 29.
1829. Larva, (col'd figs.) *Curtis.* Brit. Entom., vol. 6, pl. 248.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 271.
1859. Larva, (col'd fig.) *Humphreys.* Genera Brit. Moths, vol. 1, pl. 21.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 207.

NOTE.—The food plants of the species of Agrotis are usually grasses and low herbaceous plants. Many of the species are omnivorous.

Adita chionanthi. Abb.-Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 195, pl. 98.
FOOD PLANT. *Chionanthus virginica.*

Mamestra adjuncta. Boisd.

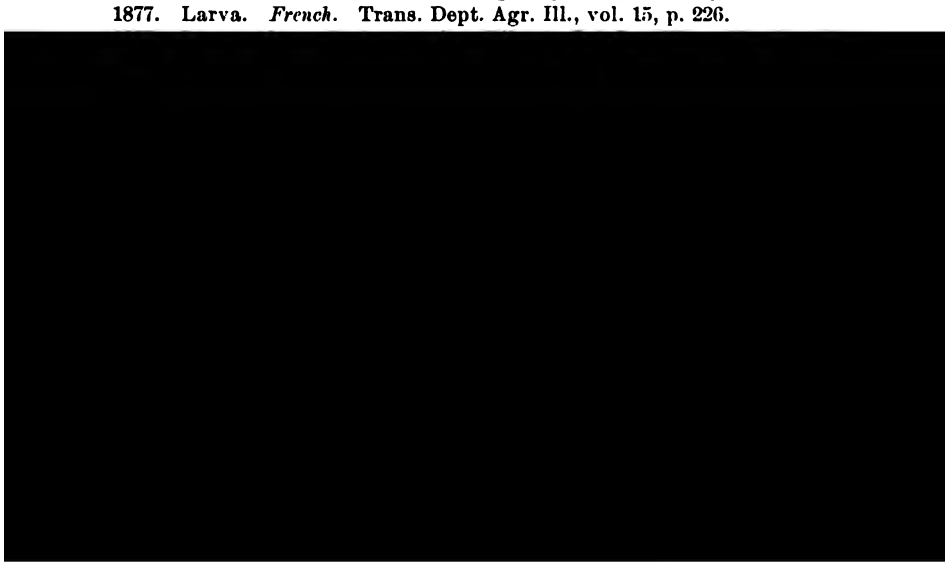
1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 161.
1877. Larva, pupa. *L. W. Goodell.* Canad. Entom., vol. 9, p. 61.
1880. Larva. *J. Marten,* (quotes Goodell.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 136.
FOOD PLANT. *Solidago.*

Mamestra assimilis. Morrison.

1881. Larva. *L. W. Goodell.* Papilio, vol. 1, p. 15.
FOOD PLANT. *Solidago*

Mamestra picta. Harris.

1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 329.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 350.
1862. Larva, pupa, (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 451.
1870. Life history, (fig.) *Riley.* 2d Missouri Rept., p. 112.
1871. Larva, (fig.) *Bethune.* Rept. Entom. Soc. Ontario, p. 426.
1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 137.
1876. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 14, p. 60.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 226.



1877. Larva. *French*, (quotes Riley.) Trans. Dept. Agr. Ill., vol. 15, p. 44.
1879. Larva. *G. J. Bowles*. Rept. Entom. Soc. Ontario, p. 44.
1880. Larva. *J. Marten*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 136.
FOOD PLANTS. *Cruciferæ*.

Mamestra distincta. Hübn.

1880. Larva. *French*. 6th Rept. Ill. Norm. Univ., p. 45.
1880. Larva, pupa. *J. Marten*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 136.
FOOD PLANT. *Vitis*.

Mamestra laudabilis. Guen.

1852. Larva, pupa. *Guen.*, (quotes Abbot in lit.) Spec. Gener. Noct., vol. 2, p. 30.
FOOD PLANTS. *Leguminosæ*.

Mamestra trifolii. Rott.

1881. Larva. *D. Coquillett*. Papilio, vol. 1, p. 7.
1881. Larva. *French*. Canad. Entom., vol. 13, p. 23.
1882. Larva. *W. F. Kirby*, (as M. chenopodii.) Europ. Butt. and Moths, p. 224.
1883. Life history, (figs.) *Riley*, (as M. chenopodii.) Rept. Entom. U. S. Dept. Agr., p. 124, pl. 1, fig. 5, and pl. 12, fig. 1, (as M. trifolii.)
1888. Larva, pupa, (figs.) *Lintner*. Bull. N. York State Museum, No. 6, p. 9.
FOOD PLANTS. *Chenopodiaceæ*.

Mamestra renigera. Steph.

1869. Larva, (fig.) *Riley*. 1st Missouri Rept., p. 86.
1877. Larva, (fig.) *French*. Trans. Dept. Agr. Ill., vol. 15, p. 215.
1879. Larva, (brief.) *G. J. Bowles*. Rept. Entom. Soc. Ontario, p. 45.
1880. Larva, (fig.) *J. Marten*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 137.
1883. Larva. *Edwards—Elliot*. Papilio, vol. 3, p. 133.
FOOD PLANT. *Cichorium intybus*.

Hadena devastatrix. Brace.

Larva. *Brace*. Silliman's Jour. Sc. and Art, vol. 1, p. 154.
1852. Larva. *Harris*, (quotes Brace.) Ins. Inj. Vegetat., 2d edit., p. 345.
1862. Larva. *Harris*, (quotes Brace.) Ins. Inj. Vegetat., Flint's edit., p. 445.
1869. Larva, (fig.) *Riley*. 1st Missouri Rept., p. 83.
1877. Larva. *C. Thomas*. Trans. Dept. Agr. Ill., vol. 15, p. 96.
1877. Larva. *French*, (quotes Riley.) Trans. Dept. Agr. Ill., vol. 15, p. 216.
1879. Larva, (fig.) *G. J. Bowles*, (quotes Harris.) Rept. Entom. Soc. Ontario, p. 38.
1880. Larva. *J. Marten*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 137.
1883. Larva, (fig.) *Saunders*. Ins. Inj. Fruits, p. 329.
1884. Life history, (brief.) *Riley*. Rept. Entom. U. S. Dept. Agr., p. 296, pl. 3, figs. 3, 4.
1885. Larva, (fig.) *Lintner*. 44th Rept. N. York State Agr. Soc., p. 58.
1888. Larva, (fig.) *Lintner*. Bull. N. York State Museum, No. 6, p. 5.
FOOD PLANTS. *Cruciferæ*, (chiefly).

Hadena arctica. Boisd.

1852. Larva. *Harris*, (as H. amica.) Ins. Inj. Vegetat., 2d edit., p. 339.
1856. Larva. *Fitch*. 3d Rept. Ins. N. York, p. 125.
1862. Larva. *Harris*. Ins. Inj. Vegetat., Flint's edit., p. 450.
1865. Larva. *B. D. Walsh*. Prac. Entom., p. 22.
1869. Larva. *Harris*. Entom. Corres., p. 316.
1869. Egg. *Minot*. Canad. Entom., vol. 2, p. 28.
1870. Larva. *Saunders*. Canad. Entom., vol. 2, p. 75.
1877. Larva. *C. Thomas*. Trans. Dept. Agr. Ill., vol. 15, p. 96.
1877. Larva. *French*. Trans. Dept. Agr. Ill., vol. 15, p. 217.
1879. Larva. *G. J. Bowles*, (quotes Harris.) Rept. Entom. Soc. Ontario, p. 39.
1880. Larva. *J. Marten*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 137.

Butt. and Moths. p. 233.

p. 138.

p. 168.

pl. 96.

p. 139.

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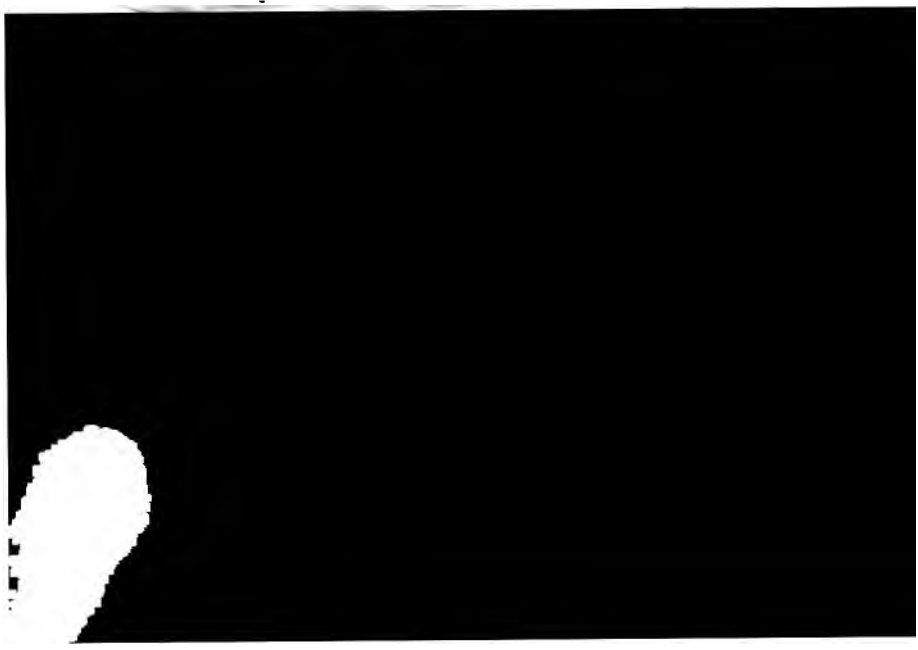
14.



1878. Larva. *French.* Canad. Entom., vol. 10, p. 61.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 139.
FOOD PLANTS. *Polygonaceæ, Gramineæ.*

Nephelodes violans. Guen.
1888. Larva. (fig.) *Lintner.* 4th Rept. State Entom. N. York, p. 54.

Apamea nictitans. Bkh.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 197.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 180.
FOOD PLANTS. *Gramineæ.*

Apamea immanis. Guen.
1884. Larva, pupa, (fig.) *T. J. Edge.* Agr. Pennsylv., p. 106.
1885. Egg, larva. *Lintner.* 2d Rept. N. York State Entom., p. 42.

Gortyna Harrisii. Gr. = **leucostigma.**
1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 320.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 341.
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 440.
FOOD PLANT. *Aquilegia.*

Gortyna nitela. Guen.
1869. Larval stages, (figs.) *Riley.* 1st Missouri Rept., p. 92.
1869. Larva, (fig.) *Packard.* Guide to Study of Ins., p. 310.
1872. Larva, (fig.) *Le Baron.* 3d Illinois Rept., p. 141.
1876. Larva, (fig.) *G. H. Perkins.* 3d Rept. Vermont Board Agr., p. 556.
1877. Larva, pupa. *Emily A. Smith.* Trans. Dept. Agr. Ill., vol. 15, p. 113.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 221.
1877. Larva. *Packard.* Inj. Ins. West, Hayden's Rept., p. 719.
1879. Larva, (fig.) *Lintner.* Rept. N. York State Agr. Soc., p. 50.
1879. Larva, (fig.) *C. Thomas.* Trans. Dept. Agr. Ill., vol. 17, Append., p. 142.
1880. Larva, (fig.) *Emily A. Smith.* 7th Illinois Rept., p. 112.
1880. Larva, (fig.) *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 151.
1880. Larva, (fig.) *A. Fuller,* (after Riley.) Amer. Entom., 2d ser., vol. 1, p. 201.
1883. Larva, (fig.) *S. A. Forbes.* Trans. Wisconsin Agr. Soc., p. 11.
1883. Larva, (fig.) *Saunders.* Ins. Inj. Fruits, p. 334.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 451.
FEEDS in stems of various plants.

Achatodes Zeæ. Harris.
1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 319.
1843. Larva. *Willis Gaylord.* Trans. N. York State Agr. Soc., p. 150.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 339.
1862. Larva, pupa. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 438.
1867. Larva. *Tenney.* Nat. Hist., p. 406.
1869. Larva. *Packard.* Guide to Study of Ins., p. 311.
1877. Larva. *Packard,* (quotes Harris.) Inj. Ins. West, Hayden's Rept., p. 719.
1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 100.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 222.
1879. Larva, pupa. *W. A. Burkhart,* (quotes Harris.) Agr. Pennsylv., p. 35.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 134.
FEEDS in stems of *Sambucus, Zea, etc.*

Arzama obliquata. G. and R.
1878. Larva. *C. E. Worthington.* Canad. Entom., vol. 10, p. 15.
1888. Life history, (brief.) *H. H. Brehme.* Canad. Entom., vol. 20, p. 119.
FEEDS in stems of *Typha latifolia.*

Arzama melanopyga. Grote.
1881. Larva. *J. H. Comstock.* Papilio, vol. 1, p. 147.
FEEDS in stalks of *Nymphæa.*

Scolecocampa liburna. Geyer.

1852. Larva, (col'd fig.) *Guen*, (after Abbot, MS.) Spec. Gener. Noct., vol. 1, p. 131, pl. 2, (as S. ligni.)
1878. Larva. *W. V. Andrews.* Psyche, vol. 2, p. 272.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 134.

FEEDS in decaying stumps of Chestnut and other trees.

Euthisanotia timais. Cramer.

1852. Larva, (col'd fig.) *Guen.*, (after Abbot, MS.) Spec. Gener. Noct., vol. 1, p. 116, pl. 2.
1857. Larva, (fig.) *Chenu—Demarets.* Encycl. Hist. Nat. Papillons, vol. 2, p. 111.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 304.

FOOD PLANT. *Pancratium.*

Monodes nucicolora. Guen.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 1, p. 241.

FOOD PLANTS. Various low herbs.

Heliophila pallens. Linn.

1829. Larva. *Stephens.* Illus. Brit. Entom., Haust., vol. 3, p. 76.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 1, p. 93.
1857. Larva. *Chenu—Demarets.* Encycl. Hist. Nat. Papillons, vol. 2, p. 76.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 190.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 160.

FOOD PLANTS. *Gramineæ.*

Heliophila albilinea. Hübn.

1877. Life history, (figs.) *Riley.* 9th Missouri Rept., p. 50.
1877. Larva. *French*, (quotes Riley.) Trans. Dept. Agr. Ill., vol. 15, p. 223
1880. Larva. *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 186.

FOOD PLANTS. *Cereals.*

Heliophila phragmitidicola. Guen.

1880. Larva. *French.* 6th Rept. Ill. State Norm. Univ., p. 46.
1880. Larva. *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 186.

FOOD PLANTS. *Gramineæ.*

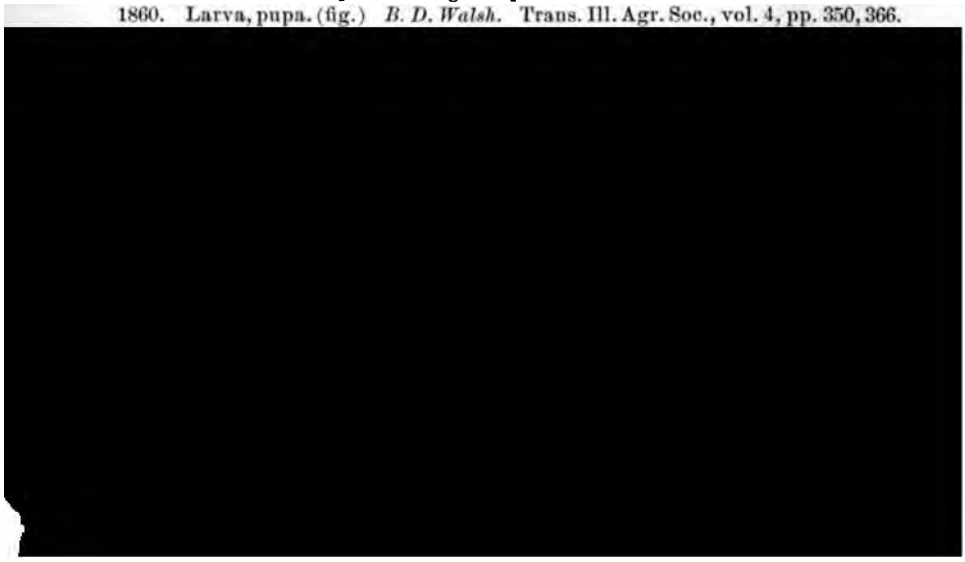
Heliophila pseudargyria. Guen.

1874. Larva. *Caulfield.* Canad. Entom., vol. 6, p. 132.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 139.
1881. Larva. *French.* Canad. Entom., vol. 13, p. 24.

FOOD PLANTS. *Gramineæ.*

Heliophila unipuncta. Haworth.

1860. Larva. *J. Kirkpatrick.* Agr. Rept. Ohio.
1860. Larva, pupa. (fig.) *B. D. Walsh.* Trans. Ill. Agr. Soc., vol. 4, pp. 350, 366.



1877. Egg, larva, pupa, (figs.) *Riley.* Rept. Massachusetts Board Agr., p. 246.
1879. Egg, larva, pupa, (figs.) *J. H. Comstock.* Rept. U. S. Dept. Agr., p. 187.
1880. Larva, pupa, (figs.) *Riley.* Amer. Entom., 2d ser., vol. 1, p. 170.
1880. Life history, (figs.) *Riley.* 3d Rept. Entom. Comm., p. 89.
1880. Larva, (fig.) *J. Fletcher.* Rept. Entom. Soc. Ontario, p. 67.
1880. Larva, pupa, (figs.) *C. Thomas.* Trans. Dept. Agr. Ill., vol. 18, Append., pp. 5, 43.
1883. Larva, pupa, (figs.) *T. J. Edge.* Agr. Pennsylv., p. 73.
1885. Egg, larva, (fig.) *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 451.
1885. Life history, (col'd figs.) *Riley.* 4th Rept. Entom. Comm.
1887. Larva, (fig.) *Fletcher.* Rept. Entom. Dept. Agr. Can., p. 11.
1888. Larva, (fig.) *J. Fletcher.* Rept. Entom. Bot. Dept. Agr. Canada, p. 11.

FOOD PLANTS. *Gramineæ.*

Pyrophila tragopoginis. Linn.

1829. Larva. *Stephens.* Illus. Brit. Entom., Haust., vol. 2, p. 165.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 2, p. 416.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 311.
1859. Larva, (col'd fig.) *Humphreys.* Genera Brit. Moths, p. 44, pl. 17.
1870. Larva. *Saunders.* Canad. Entom., vol. 2, p. 73.
1871. Larva. *Saunders,* (as A. depressus.) Canad. Entom., vol. 3, p. 193.
1871. Larva. *Saunders,* (as A. depressus.) Rept. Entom. Soc. Ontario, p. 360.
1883. Larva, pupa. *Saunders.* Ins. Inj. Fruits, p. 275.

FOOD PLANTS. Various.

Pyrophila pyramidoides. Guen., (and vars.)

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 2, p. 414.
1871. Larva, (figs.) *Riley.* 3d Missouri Rept., pp. 73, 75.
1871. Larva, (figs.) *Le Baron,* (after Riley.) 2d Ill. Rept., p. 56.
1871. Larva, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 360.
1874. Larva. *Saunders.* Canad. Entom., vol. 6, p. 27.
1875. Larva. *Saunders.* Canad. Entom., vol. 7, p. 14.
1877. Larva, cocoon, pupa, (fig.) *French.* Trans. Dept. Agr. Ill., vol. 15, p. 225.
1878. Larva. *G. H. Perkins.* 5th Rept. Vermont Board Agr., p. 273.
1880. Larva, (fig.) *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 180.
1883. Larva, pupa, (fig.) *Saunders.* Ins. Inj. Fruits, p. 274.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 450.

FOOD PLANTS. *Vitis, Ampelopsis.*

Taeniocampa incerta. Hübn.

1852. Larva. *Guen.,* (as T. hibisci.) Spec. Gener. Noct., vol. 1, p. 355.
1856. Larva. *Fitch,* (as Orth. instabilis.) 3d Rept. Ins. N. York, p. 313.
1859. Larva. *H. T. Stainton,* (as Orth. instabilis.) Brit. Butt. and Moths, vol. 1, p. 243.

FOOD PLANTS. *Quercus, Salix, Prunus.*

Zotheca tranquilla. Grote.

1878. Larva. *Hy. Edwards.* Proc. Cal. Acad. Sc., June.

FOOD PLANT. *Sambucus.*

Calymnia orina. Guen.

1873. Larva. *Saunders.* Canad. Entom., vol. 5, p. 206.
1881. Larva. *Packard,* (quotes Saunders.) Ins. Inj. Forest Trees, p. 47.

FOOD PLANT. *Quercus.*

Scoliopteryx libatrix. Linn.

1829. Larva. *Stephens.* Illus. Brit. Entom., Haust., vol. 3, p. 50.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 2, p. 406.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 309.
1859. Larva, (col'd fig.) *Humphreys.* Genera Brit. Moths, pl. 25.
1860. Larva, (brief.) *Duncan.* Natural. Library, vol. 30, p. 232.
1872. Larva, (fig.) *J. G. Wood.* Insects at Home, p. 481.

1881. Larva. *D. Coquillett.* Papilio, vol. 1, p. 56.
1882. Larva, pupa, (brief.) *W. F. Kirby.* Europ. Butt. and Moths, p. 185.
FOOD PLANT. *Salix.*

Scopelosoma devia. Grote.
1884. Life history. *Thaxter.* Canad. Entom., vol. 16, p. 33.
FOOD PLANT. *Quercus.*

Scopelosoma morrisonii. Grote.
1884. Life history. *Thaxter.* Canad. Entom., vol. 16, p. 30.
FOOD PLANT. *Quercus.*

Scopelosoma vinulenta. Grote.
1884. Life history. *Thaxter.* Canad. Entom., vol. 16, p. 32.
FOOD PLANTS. *Quercus, Azalea.*

Scopelosoma walkeri. Grote.
1884. Life history. *Thaxter.* Canad. Entom., vol. 16, p. 31.
FOOD PLANT. *Quercus.*

Scopelosoma tristigmata. Grote.
1884. Life history. *Thaxter.* Canad. Entom., vol. 16, p. 33.
FOOD PLANT. *Quercus.*

Scopelosoma moffatiana. Gr.
1888. Larva. *R. F. Pearsall.* Entom. Amer., vol. 4, p. 59.

Lithophane antennata. Walker.= **cinerea.**
1871. Life history, (fig's.) *Riley.* 3d Missouri Rept., p. 135.
1877. Larva. *French,* (quotes Riley.) Trans. Dept. Agr. Ill., vol. 15, p. 227.
1883. Larva, (fig's.) *Saunders.* Ins. Inj. Fruits, p. 138.
FOOD PLANT. Various fruit trees and fruits.

Lithophane laticinerea. Grote.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 135.
FOOD PLANT. *Cerasus.*

Calocampa nupera. Lintner.
1878. Larva. *Thaxter.* Psyche, vol. 2, p 122.

Calocampa curvimacula. Morrison.
1878. Larva. *Thaxter.* Psyche, vol. 2, p. 122.

Cucullia convexipennis. G. and R.
1869. Larva. *Lintner.* 23d Rept. N. York State Cab. N. Hist., p. 215.
1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 138.
FOOD PLANT. *Solidago.*

Cucullia asteroides. Guen.
1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 139.
FOOD PLANT. *Solidago.*

1883. Larva, cocoon. *Saunders.* Ins. Inj. Fruits, p. 101.
FOOD PLANT. *Pyrus, (apple.)*

Anomis erosa. Hübn.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 2, p. 395.
1885. Life history, (col'd figs.) *Riley.* 4th Rept. Entom. Comm.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 321.
FOOD PLANT. *Urena lobata.*

Aletia argillacea. Hübn.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 356.
1855. Egg, larva, pupa. *T. Glover.* Trans. N. York State Agr. Soc., p. 71.
1857. Larva, pupa. *Fitch.* 4th Rept. Ins. N. York.
1862. Larva. *Harris,* Ins. Inj. Vegetat., Flint's edit., p. 457.
1869. Larva. *Packard.* Guide to Study of Ins., p. 313.
1870. Life history, (figs.) *Riley.* 2d Missouri Rept., p. 38.
1875. Larva, pupa. *Grote.* Rept. Geol. Alabama, p. 199.
1877. Egg, larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 228.
1877. Egg, larva, (figs.) *Packard,* (quotes Riley and Grote.) Inj. Ins. West, Hayden's Rept., p. 775.
1877. Egg, larva, (fig.) *Packard.* Half-hours with Insects, p. 221.
1879. Egg, larva, pupa, (col'd figs.) *J. H. Comstock.* Rept. on Cotton Ins., Dept. Agr., p. 75.
1880. Larva, pupa, (figs.) *Riley.* Amer. Entom., 2d series, vol. 1, p. 6.
1885. Life history, (col'd figs.) *Riley.* 4th Rept. U. S. Entom. Comm.
1885. Egg, larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 450.
FOOD PLANTS. *Malvaceæ.*

Ingura præpilata. Grote.
1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 135.
FOOD PLANT. *Liquidambar styraciflua.*

Ingura delineata. Guen.
1852. Larva. *Guen.,* (after Abb., MS.) Spec. Gener. Noct., vol. 2, p. 311.
1852. Larva, pupa. *Guen.* Spec. Gener. Noct., vol. 3, p. 397.
FOOD PLANT. *Tabernæmontana laurifolia.*

Calpe canadensis. Bethune.
1878. Larva. *Thaxter.* Psyche, vol. 2, p. 123.
1880. Larva. *D. Coquillett.* Canad. Entom., vol. 12, p. 44.
1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 137.
1880. Larva. *D. Coquillett.,* Trans. Dept. Agr. Ill., vol. 18, Append., p. 172.
FOOD PLANT. *Thalictrum cornutum.*

Telesilla cinereola. Guen.
1880. Larva. *D. Coquillett.* N. Amer. Entom., No. 7, p. 52.
1880. Larva. *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 180.
FOOD PLANT. *Ambrosia.*

Hypsoropha hormos. Hübn.
1852. Larva. *Guen.* Spec. Gener. Noct. vol. 2, p. 403.
FOOD PLANT. *Dyospyros virginiana.*

Plusia aereoides. Grote.
1876. Larva, pupa. *Thaxter.* Psyche, vol. 1, p. 188.
FOOD PLANT. *Spiræa salicifolia.*

Plusia balluca. Geyer.
1863. Larva. *Saunders.* Proc. Entom. Soc. Philad., vol. 2, p. 29.
1872. Cocoon, pupa. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 163.
1873. Larva. *Saunders.* Canad. Entom., vol. 5, p. 10.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 228.

Plusia contexta. Grote.
1883. Life history. *Thaxter.* Papilio, vol. 3, p. 18.
FOOD PLANTS. *Gramineæ.*

Plusia putnami. Grote.

1883. Larva, (brief). *Thaxter.* Papilio, vol. 3, p. 19.

Plusia dyaus. Grote.

1885. Larva, pupa. *Lintner.* 2d Rept. State Entom. N. York, p. 94.

Plusia precationis. Guen.

1869. Larva. *Packard.* Guide to Study of Ins., p. 312.
1880. Larva. *D. Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 148.
1881. Life history. *D. Coquillett.* Canad. Entom., vol. 13, p. 21.

FOOD PLANTS. *Plantago, Arctium, Taraxacum, etc.*

Plusia brassicæ. Riley.

1870. Larva, pupa, (figs.) *Riley.* 2d Missouri Rept., p. 110.
1871. Larva, pupa, (figs.) *Bethune.* Rept. Entom. Soc. Ontario, p. 247.
1877. Larva, cocoon, pupa, (figs.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 752.
1877. Larva. *French,* (quotes Riley.) Trans. Dept. Agr. Ill., vol. 15, p. 230.
1879. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 17, p. 41.
1880. Larva, cocoon, pupa, (figs.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 140.
1883. Life history, (figs.) *Riley.* Rept. Entom. U. S. Dept. Agr., p. 119, pl. 11, figs. 2, 5.
1885. Larva, pupa, (fig.) *Lintner.* 2d Rept. State Entom. N. York, p. 90.

FOOD PLANTS. *Brassica* and other *Cruciferæ.*

Plusia hochenwarthii. Hoch.

1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 266.

Plusia devergens. Hübn.

1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 266.

Ararta cordigera. Thurb.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 293.

FOOD PLANT. *Vaccinium.*

Chloridea rhexiæ. Abb.-Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 199, pl. 100.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 2, p. 175.
1858. Larva. *Duncan.* Natural. Library, vol. 22, p. 199.
1880. Larva. *French.* 6th Rept. Ill. State Norm. Univ., p. 46.
1880. Larva. *Riley.* Amer. Entom., 2d series, vol. 1, p. 7.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 310.

FOOD PLANTS. *Rheria Virginica, Sesamum, Nicotiana.*

Heliothis armigera. Hübn.

1855. Egg, larva, pupa. *T. Glover.* Trans. N. York State Agr. Soc., p. 99.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 292
1871. Egg, larva, (fig.) *Riley.* 3d Missouri Rept., p. 105.
1877. Egg, larva. *Packard.* Half-hours with Ins., p. 224.
1877. Larva. *Packard.* Inj. Ins. West, Hayden's Rept., p. 778.
1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 103.
1877. Larva, pupa. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 232.
1879. Life history, (col'd figs.) *J. H. Comstock.* Rept. Cotton Ins. Dept. Agr., p. 297.
1880. Egg, larva, cocoon, pupa, (figs.) *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 150.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 225.
1883. Larva, cocoon, pupa, (figs.) *S. S. Rathvon.* Agr. Pennsylv., p. 238.
1885. Life history, (col'd figs.) *Riley.* 4th Rept. (U. S.) Entom. Comm.
1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 309.

FOOD PLANTS. *Cotton, Reseda.*

Pyrrhia exprimens. Hübn.

1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 163.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 233.
1883. Larva, pupa. *Edwards—Elliot.* Papilio, vol. 3, p. 135.

FOOD PLANT. *Desmodium.*

Pyrrhia angulata. Grote.

1881. Larva. *Coquillett.* Papilio, vol. 1, p. 8.

FOOD PLANT. *Polygonum.*

Tarache erastrioides. Guen.

1881. Larva. *Coquillett.* Papilio, vol. 1, p. 8.
1883. Larva, (brief.) *Coquillett.* Papilio, vol. 3, p. 84.

FOOD PLANT. *Ambrosia.*

Tarache candefacta. Hübn.

1852. Larva, (col'd fig.) *Guen.* W. Spec. Gener. Noct., vol. 2, p. 26, pl. 2.
1883. Larva, (brief.) *Coquillett.* Papilio, vol. 3, p. 84.

FOOD PLANT. *Ambrosia.*

Tarache delecta. Walk.

1870. Larva, pupa, (fig.) *Packard,* (as Acon. metallica, after Abbot.) Amer. Naturalist, vol. 4, p. 229.
1888. Larva. *A. C. Weeks.* Entom. Amer., vol. 4, p. 46.

FOOD PLANT. *Hibiscus moschentos.*

Chamyris cerintha. Tr.

1881. Larva. *Coquillett.* Papilio, vol. 1, p. 56.

FOOD PLANT. *Pyrus.*

Eustrotia carneola. Guen.

1881. Larva. *Coquillett.* Papilio, vol. 1, p. 7.

FOOD PLANT. *Rumex.*

Xanthoptera semicrocea. Guen.

1852. Larva, (col'd fig.) *Guen.*, (after Abb., M. S.) Spec. Gener. Noct., pl. 2.
1869. Larva. *Packard.* Guide to Study of Ins., p. 316.
1874. Life history, (figs.) *Riley.* Canad. Entom., vol. 6, p. 208.

FOOD PLANT. *Sarracenia.*

Exyra rolandiana. Grote.

1877. Larva. *Thaxter.* Psyche, vol. 2, p. 39.

FOOD PLANT. *Sarracenia.*

Drasteria erechtea. Cram.

1868. Larva. *Saunders.* Canad. Entom., vol. 1, p. 4.
1869. Larva, (fig.) *Harris.* Entom. Corres., pp. 175, 318.
1869. Larva. *Packard.* Guide to Study of Ins., p. 317.

1875. Larva. *Saunders.* Rept. Entom. Soc. Ontario, p. 37.
1875. Egg. *Hy. Edwards.* Proc. Cal. Acad. Sc., April.
1875. Larva. *Saunders.* Canad. Entom., vol. 7, p. 116.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 233.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 148.
1882. Larva. *Saunders.* 12th Rept. Entom. Soc. Ontario, p. 47.
1884. Life history. *French.* Papilio, vol. 4, p. 148.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 449.
FOOD PLANT. *Trifolium.*

Syneda graphica. Hübn.
1852. Larva, (col'd fig.) *Guen.*, (after Abb., MS.) Spec. Gener. Noct., vol. 3, p. 72, pl. 2.

Catocala epione. Drury.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 3, p. 93.
FOOD PLANT. *Quercus.*

Catocala desperata. Guen. = **vidua.** Abb.-Sm.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 181, pl. 91.
1852. Larva. *Guen.*, (quotes Abb.-Sm.) Spec. Gener. Noct., vol. 3, p. 95.
1888. Life history. *French.* Canad. Entom., vol. 20, p. 28.
FOOD PLANTS. *Carya, Quercus.*

Catocala flebilis. Grote.
1881. Larva, pupa. *D. Kellicott.* Papilio, vol. 1, p. 141.
FOOD PLANT. *Carya.*

Catocala relicta. Walk.
1888. Life history. *Howard L. Clark.* Canad. Entom., vol. 20, p. 17.
FOOD PLANT. *Salix.*

Catocala amatrix. Hübn.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 3, p. 86.
1881. Larva, (brief.) *Ph. Fischer.* Bull. Buffalo Soc. Nat. Hist., vol. 4, p. 62.
1881. Larva, pupa. *D. Kellicott.* Papilio, vol. 1, p. 142.
1884. Life history. *French.* Papilio, vol. 4, p. 8.
FOOD PLANT. *Populus.*

Catocala cara. Guen.
1881. Larva. *A. Koebele,* (as C. carissima.) Bull. Brooklyn Entom. Soc., vol. 4, p. 22.
FOOD PLANT. *Salix.*

Catocala concumbens. Walker.
1863. Larva. *Saunders.* Proc. Entom. Soc. Philad., vol. 2, p. 29.

1874. Larva. *Saunders.* Canad. Entom., vol. 6, p. 147.
1879. Larva, pupa, (brief.) *Saunders.* Rept. Entom. Soc. Ontario, p. 74.
1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 177.
FOOD PLANTS. *Prunus, Cornus, Quercus.*

Catocala illa. Cram.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 3, p. 92.
1875. Larva. *Caulfield.* Canad. Entom., vol. 7, p. 208.
1881. Larva. *A. Koebele.* Bull. Brooklyn Entom. Soc., vol. 4, p. 22.
1884. Life history. *French.* Canad. Entom., vol. 16, p. 12.
FOOD PLANT. *Quercus.*

Catocala zoe. Behr.
1870. Larva, (brief.) *Behr.* Trans. Amer. Entom. Soc., p. 24.
FOOD PLANT. *Quercus.*

Catocala neogama. Abb.–Sm.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, pl. 88.
1852. Larva. *Guen.*, (quotes Abb.–Sm.) Spec. Gener. Noct., vol. 3, p. 96.
1858. Larva, (col'd fig.) *Duncan.* Natural. Library, vol. 27, p. 203, pl. 26.
FOOD PLANT. *Quercus.*

Catocala palæogama. Guen.
1888. Life history. *French.* Canad. Entom., vol. 20, p. 108.
FOOD PLANT *Carya.*

Catocala muliercula. Guen.
1852. Larva, col'd fig.) *Guen.*, (after Abb., M. S.) Spec. Gener. Noct., vol. 3, p. 97, pl. 2.
FOOD PLANTS. *Myrtaceæ.*

Catocala concors. Abb.–Sm.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 177, pl. 89.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 3, p. 99.
FOOD PLANTS. *Myrtaceæ, Leguminosæ.*

Catocala polygama. Guen.
1869. Larva. *E. B. Reed.* Canad. Entom., vol. 2, p. 30.
1876. Larva. *Saunders.* Canad. Entom., vol. 8, p. 74.
FOOD PLANT. *Crataegus.*

Catocala cratægi. Saunders.
1876. Larva. *Saunders.* Canad. Entom., vol. 8, p. 72.
FOOD PLANT. *Crataegus.*

Catocala amasia. Abb.–Sm.
1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 179, pl. 90.
1852. Larva. *Guen* quotes Abb.–Sm.) Spec. Gener. Noct., vol. 3, p. 101.
1858. Larva. *Duncan* Natural. Library, vol. 22, p. 205.
FOOD PLANT. *Melia azedarach.*

Catocala fratercula. G. and R.
1881. Larva. *Coquillett.* Papilio, vol. 1, p. 7.
FOOD PLANT. *Quercus.*

Catocala grynea. Cram.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 183.
1881. Larva. *A. Koebele.* Bull. Brooklyn Entom. Soc., vol. 4, p. 22.
FOOD PLANT. *Pyrus.*

Catocala amica. Hübn.
1852. Larva. *Guen.* Spec. Gener. Noct., vol. 3, p. 106.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 182.
1881. Larva. *Coquillett.* Papilio, vol. 1, p. 7.
FOOD PLANT. *Quercus.*

Parthenos nubilis. Hübn.
1869. Larva. *Harris.* Entom. Corres., p. 319.
FOOD PLANT. *Robinia.*

Allotria elonympha. Hübn.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 3, p. 37.

FOOD PLANTS. *Juglans, Glycine.*

Parallelia bistriaris. Hübn.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 3, p. 268.

1870. Larva. *Saunders.* Canad. Entom., vol. 2, p. 130.

1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 113.

1883. Larva. *Edwards—Elliot.* Papilio, vol. 3, p. 136.

FOOD PLANT. *Acer rubrum.*

Agnomonia anilis. Hübn.

1852. Larva, pupa. *Guen.* Spec. Gener. Noct., vol. 3, p. 274.

FOOD PLANT. *Chironia.*

Panopoda roseicosta. Guen.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 3, p. 325.

FOOD PLANT. *Juglans.*

Remigia latipes. Guen.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 3, p. 315.

1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 354.

FOOD PLANT. *Hypericum.*

Poaphila flavistriaria. Hübn.

1852. Larva, pupa, (col'd figs.) *Guen.* Spec. Gener. Noct., vol. 3, p. 302, pl. 2.

FOOD PLANT. *Scutellaria.*

Poaphila sylvarum. Guen.

1852. Larva. *Guen.*, (from Abb., MS.) Spec. Gener. Noct., vol. 3, p. 300.

FOOD PLANT. *Andromeda ferruginea.*

Poaphila quadrifilaris. Hübn.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 3, p. 300.

FOOD PLANT. *Gossypium.*

Erebus odora. Linn.

1886. Larva, pupa. *Gundlach.* Entom. Cubana, p. 367.

1887. Larva, (brief.) *H. T. Fernald.* Entom. Amer., vol. 3, p. 78.

1888. Egg, young larva. *H. T. Fernald*, (quotes Wm. Blake in MS.) Entom. Amer., vol. 4, p. 36.

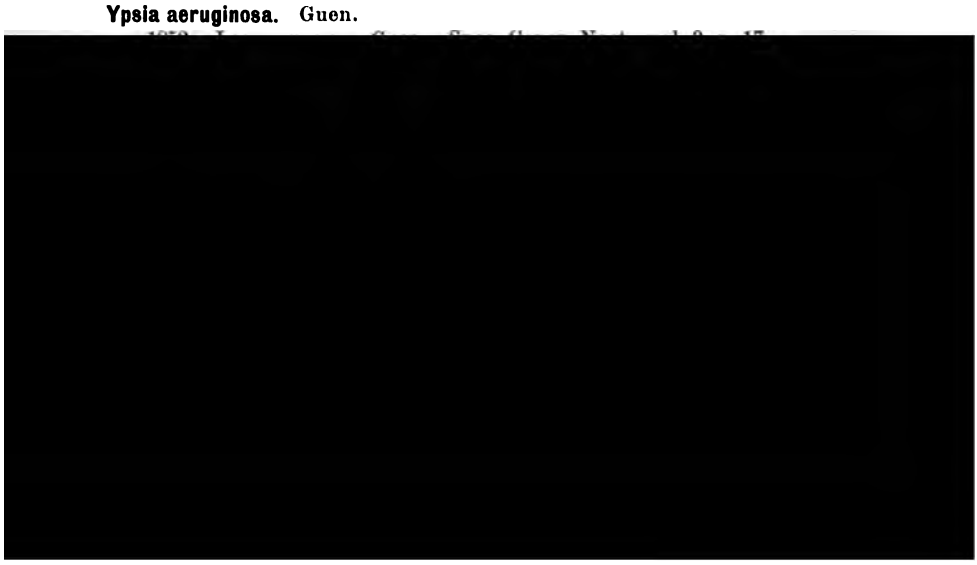
FOOD PLANTS. *Cassia fistula, Pithecolobium, Saman.*

Pheocyma lunifera. Hübn.

1886. Larva, pupa. *Packard.* Bull. No. 12, U. S. Dept. Agr., p. 22.

FOOD PLANT. *Pinus.*

Ypsia aeruginosa. Guen.



Pseudanthrœcia coracias. Guen.

1852. Larva, (col'd fig.) *Guen.* Spec. Gener. Noct., vol. 3, p. 19, pl. 2.

FOOD PLANT. *Quercus.*

Epizeuxis americalis.

1854. Larva, pupa. *Guen.* Spec. Gener. Delt. Pyral., vol. 8, p. 78.

FOOD PLANTS. *Leguminosæ.*

Epizeuxis aemul. Hübn.

1870. Larva, pupa, (figs). *Packard,* (as Helia æmulalis—after Abbot, MS.) Amer. Naturalist, vol. 4, p. 229.

1886. Larva, pupa. *Packard.* Rept. Entom. U. S. Dept. Agr., p. 326.

FOOD PLANT. *Phlox.*

Pseudaglossa lubricalis. Geyer.

1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 138.

1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 182.

1880. Larva. *Coquillett.* Canad. Entom., vol. 12, p. 44.

FOOD PLANTS. *Gramineæ.*

Chytolita morbidalis. Guen.

1880. Larva. *Coquillett.* Canad. Entom., vol. 12, p 44.

1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 138.

1880. Larva. *Coquillett.* Loc. cit., p. 182.

FOOD PLANTS. *Corylus, Gramineæ.*

Philometra serraticornis. Grote.

1877. Larva, pupa. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 246.

FEEDS on roots of grasses.

Hypæna evanidalis. Robinson.

1856. Larva, pupa. *Fitch,* (as H. humuli.) 2d Rept. Ins. N. York, p. 324.

1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 148.

FOOD PLANT. *Humulus.*

Hypæna scabra. Fabr. = **humuli.** Harris.

1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 345.

1862. Larva, cocoon. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 372.

1862. Larva, cocoon. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 477.

1868. Larva, pupa, (figs.) *Packard.* Amer. Naturalist, vol. 2, p. 333.

1869. Larva, (fig.) *Packard.* Guide to Study of Ins., p. 327.

1869. Larva. *Harris.* Entom. Corres., p. 322.

1872. Larva. *Bethune.* Rept. Entom. Soc. Ontario.

1877. Larva, pupa, (figs.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 773.

1877. Larva. *French,* (quotes Bethune.) Trans. Dept. Agr. Ill., vol. 15, p. 245.

1879. Larva, pupa. *J. H. Comstock.* Rept. Entom. Dept. Agr., p. 252.

1880. Larva. *Coquillett.* Canad. Entom., vol. 12, p. 43.

1880. Larva. *Riley.* Amer. Entom., 2d series, vol. 1, p. 8.

1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 148.

1881. Life history. *Coquillett.* Canad. Entom., vol. 13, p. 137.

FOOD PLANTS. *Humulus, Trifolium, etc.*

Hypæna madefactalis. Guen.

1854. Larva. *Guen.* Spec. Gener. Delt. Pyral., vol. 8, p. 35.

FOOD PLANT. *Alisma plantago.*

GEOMETRIDÆ.

Choerodes clemitaria. Abb.–Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 201, pl. 101.

1876. Larva. *Packard.* Monogr. Geometr., p. 562.

1887. Larva, (brief.) *D. Bruce.* Entom. Amer., vol. 3, p. 47.

FOOD PLANTS. *Ulmus, Clematis, etc.*

Choerodes transversata. Drury.

1833. Larva, (col'd fig.) *Titian Peale.* Lep. Americana, pl. 9.

1876. Larva, pupa, (figs.) *Packard*, (after Abbot's MS. drawing.) Monogr. Geometr., p. 561, pl. 13.
1880. Larva, pupa. *L. W. Goodell.* Canad. Entom., vol. 12, p. 236.
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 112.
1887. Larva, (brief.) *D. Bruce.* Entom. Amer., vol. 3, p. 47.
FOOD PLANTS. *Myrica, Geranium, Acer, etc.*

Choerodes falcata. Packard.
1876. Egg, (brief.) *Packard.* Monogr. Geometr., p. 558.

Tetracis ægrotata. Guen.
1874. Larva, cocoon, pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc., September.
FOOD PLANTS. *Geranium, Rosa, etc.*

Tetracis crocallata. Guen.
1869. Egg, larva. *Minot.* Canad. Entom., vol. 2, p. 28.
1876. Larva. *Packard,* (quotes Minot.) Monogr. Geometr., p. 548.
1879. Larva, pupa. *L. W. Goodell.* Canad. Entom., vol. 12, p 193.
1887. Larva, (brief.) *D. Bruce.* Entom. Amer., vol. 3, p. 47.
FOOD PLANTS. *Castanea, Rhus, etc.*

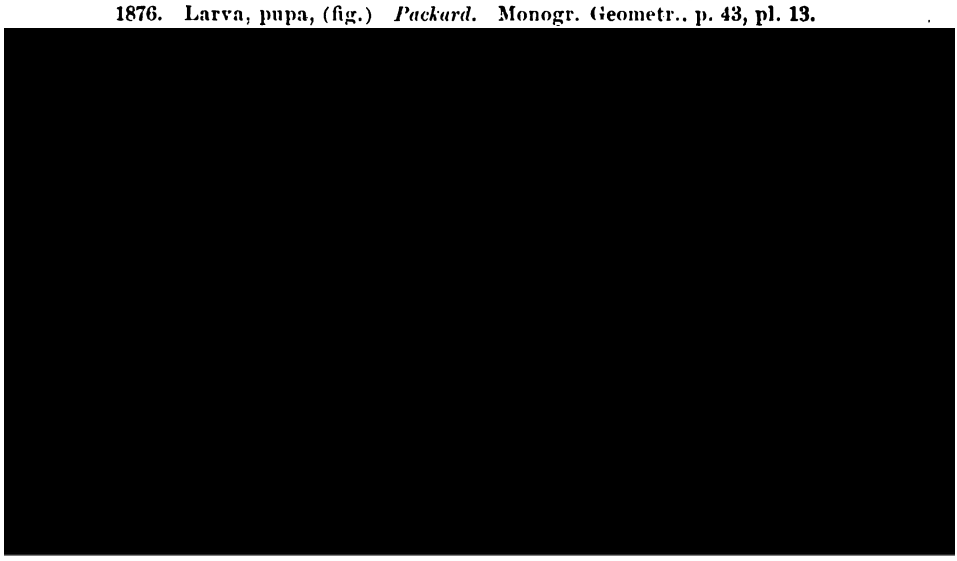
Tetracis lorata. Grote.
1869. Egg. *Minot.* Canad. Entom., vol. 2, p. 28.
1876. Pupa, (fig.) *Packard.* Monogr. Geometr., pl. 13.
1877. Larva, pupa. *L. W. Goodell.* Canad. Entom., vol. 9, p. 62.
1884. Larva, pupa. *Packard.* Amer. Naturalist, vol. 18, p. 935.
FOOD PLANT. *Comptonia asplenifolia.*

Tetracis trianguliferata. Packard.
1886. Life history. *French.* Canad. Entom., vol. 18, p. 105.
FOOD PLANT. *Ribes aureum.*

Metanema quercivoraria. Guen.
1857. Larva. *Guen.*, (after Abbot's MS. drawing.) Spec. Gener. Phal., vol. 1, p. 172.
1876. Larva. *Packard,* (quotes Guen.) Monogr. Geometr., p. 545.
1881. Larva, (brief.) *Packard.* Ins. Inj. Forest Trees, p. 51.
FOOD PLANT. *Quercus.*

Metanema inatomaria. Guen.
1887. Larva, (brief.) *D. Bruce.* Entom. Amer., vol. 3, p. 47.
FOOD PLANT. *Populus.*

Drepanodes varus. G. and R.
1875. Larva, (fig.) *Packard.* Amer. Naturalist, vol. 9, p. 180.
1876. Larva, pupa, (fig.) *Packard.* Monogr. Geometr., p. 43, pl. 13.



1888. Cocoon, (brief.) *M. S. Crane.* Entom. Amer., vol. 4, p. 13.
FOOD PLANTS. *Betula, Alnus, Castanea, etc.*

Ennomos subsignaria. Hübn.
1866. Life history. *Graef—Wiebe.* Rept. Brooklyn Hort. Soc.
1866. Larva. *B. D. Walsh.* Pract. Entom., p. 57.
1868. Larva. *Packard.* Amer. Naturalist, vol. 2, p. 333.
1876. Larva. *Packard.* Monogr. Geometr., p. 528.
1887. Larva. *French.* Trans. Dept. Agr. Ill., vol. 75, p. 224.
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 62.
1882. Life history, (brief.) *C. R. Dodge.* Canad. Entom., vol. 14, p. 30.
1882. Life history, (brief.) *C. R. Dodge.* Rept. Entom. Soc. Ontario, p. 18.
1883. Egg, larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 112.
FOOD PLANTS. Various trees.

Selenia kentaria. G. and R.
1887. Egg, larva, (brief.) *D. Bruce.* Entom. Amer., vol. 3, p. 47.
FOOD PLANTS. *Betula, Acer, etc.*

Endropia obtusaria. Hübn.
1876. Larva, (fig.) *Packard,* (after Abbot's MS. drawing.) Monogr. Geometr., p. 517, pl. 13.
FOOD PLANT. *Impatiens.*

Endropia pectinaria. W. V.
1876. Larva. *Packard.* Monogr. Geometr., p. 513.
1881. Larva. *Packard,* (after Abbot's MS. drawing.) Ins. Inj. Forest Trees, p. 50.
FOOD PLANTS. *Quercus, etc.*

Endropia bilinearia. Packard.
1881. Larva, (brief.) *Packard.* Ins. Inj. Forest Trees, p. 49.
1887. Larva, (brief.) *D. Bruce.* Entom. Amer., vol. 3, p. 17.
FOOD PLANTS. *Prunus, Quercus, etc.*

Endropia armataria. H. Sch.
1869. Larva. *Fitch.* 13th Rept. Ins. N. York, p. 522.
1871. Larva. *Saunders.* Canad. Entom., vol 3, p. 130.
1871. Larva. *Saunders.* Rept. Entom. Soc. Ontario, p. 378.
1872. Larva. *T. Glover.* Rept. Entom. Trans. N. York State Agr. Soc., p. 83.
1883. Larva, pupa. *Saunders.* Ins. Inj. Fruits, p. 351.
FOOD PLANT. *Ribes.*

Endropia textrinaria. G. and R.
1869. Larva, pupa, (fig.) *Packard,* (after Abbot's MS. drawing.) Monogr. Geometr., p. 508, pl. 13.
1884. Larva, pupa. *Packard.* Amer. Naturalist, vol. 18, p. 931.
FOOD PLANT. *Quercus.*

Metrocampa margaritata. Linn.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 10.
1859. Larva, (brief.) *Humphreys.* Gener. Brit. Moths, p. 86.
1869. Larva. *Newman.* Brit. Moths, p. 53.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 298.
FOOD PLANTS. *Quercus, Betula, Fagus, etc.*

Therina fervidaria. Hübn.
1876. Larva, pupa, (fig.) *Packard,* (after Abbot's MS. drawing.) Monogr. Geometr., p. 491, pl. 13.
1886. Larva, pupa. *Packard.* Rept. Entom. U. S. Dept. Agr., p. 329.
FOOD PLANT. *Halesia diptera.*

Therina endropiaria. G. and R.
1879. Larva. *L. W. Goodell.* Canad. Entom., vol. 11, p. 194.
FOOD PLANT. *Quercus.*

Hadena remissa. Hübn.

1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 233.

Hadena turbulenta. Hübn.

1888. Larva. *W. Beutenmüller.* Canad. Entom., vol. 20, p. 136.

FOOD PLANT. *Smilax.*

Dipterygia scabriuscula. Linn.

1829. Larva, pupa. *Stephens.* Illus. Brit. Entom., Haust., vol. 2, p. 168.

1852. Larva. *Guen.* Spec. Gener. Noct., vol. 1, p. 147.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 1, p. 201.

1859. Larva. *Humphreys.* Gen. Brit. Moths, p. 44.

1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 237.

FOOD PLANT. *Rumex.*

Hyppa xylinoides. Guen.

1869. Life history. *Saunders.* Canad. Entom., vol. 2, p. 33.

1888. Larva, (brief.) *Lintner.* 4th Rept. State Entom., p. 138.

FOOD PLANTS. Various.

Polia vorax. Behrens.

1884. Larva, (brief.) *J. Behrens.* Papilio, vol. 4, p. 21.

Laphygma frugiperda. Abb.-Sm.

1796. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 191, pl. 96.

1852. Larva. *Guen,* (quotes Abbot.) Spec. Gener. Noct., vol. 1, p. 159.

1871. Egg, larva, (figs.) *Riley.* 3d Missouri Rept., p. 112.

1876. Larva, (fig.) *Riley.* 8th Missouri Rept., p. 48.

1877. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 97.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 219.

1880. Larva, (fig.) *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 138.

1885. Egg, larva, (fig.) *Hubbard.* Ins. Affecting Oranges, p. 150.

1885. Larva, pupa. *Gundlach.* Entom. Cubana, p. 288.

1888. Larva, (fig.) *Lintner.* Bull. N. York State Museum, No. 6, p. 14.

FOOD PLANTS. *Cereals, etc.*

Prodenia phytolaccæ. Abb.-Sm.

1797. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 193, pl. 97.

FOOD PLANT. *Phytolacca.*

Prodenia commelinæ. Abb.-Sm.

1796. Larva, (col'd fig.) *Abbot—Smith.* Lep. Ins. Georgia, p. 189, pl. 95.

1852. Larva. *Guen,* (quotes Abb.-Sm.) Spec. Gener. Noct., vol. 1, p. 162.

1871. Larva, (fig.) *Riley.* 3d Missouri Rept., p. 113.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 220.

1880. Larva. *J. Marten.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 138.

1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 316.
FOOD PLANT. *Rubus.*

Synchlora excurvaria. Packard.
1876. Larva, (fig.) *Packard,* (after Abbot's MS. drawing.) Monogr. Geometr.; pl. 13.

Chlorosea bistriaria. Packard.
1888. Larva. *Hulst.* Entom. Amer., vol. 3, p. 193.
FOOD PLANT. *Solidago.*

Encrostis chloroleucaria. Guen.
1879. Larva, pupa. *Hulst.* Bull. Brooklyn Entom. Soc., vol. 2, p. 78.
1880. Larva, pupa. *L. W. Goodell.* Canad. Entom., vol. 12, p. 235.
FOOD PLANTS. *Leucanthemum vulgare, Helianthus, etc.*

Dysteris abortivaria. H. Sch.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 238.
FOOD PLANT. *Vitis.*

Ephyra pendulinaria. Guen.
1876. Larva, pupa, (fig.) *Packard,* (quotes Scudder in MS.) Monogr. Geometr., p. 363, pl. 13.
FOOD PLANT. *Comptonia asplenioides.*

Ephyra myrtaria. Guen.
1877. Larva, pupa. *L. W. Goodell.* Canad. Entom., vol. 9, p. 62.
FOOD PLANTS. *Comptonia, Gaylussacia.*

Arrhostia lumenaria. Hübn.
1876. Larva, pupa, (fig.) *Packard,* (after Abbot's MS. drawing.) Monogr. Geometr., p. 365, pl. 13.
FOOD PLANT. *Psoralea.*

Acidalia insularia. Guen.
1876. Pupa, (fig) *Packard.* Monogr. Geometr., p. 336, pl. 13.
1887. Larva, pupa. *Hulst.* Entom. Amer., vol. 3, p. 175.
FOOD PLANT. *Cassia chamæcrista.*

Acidalia enucleata. Guen.
1857. Larva, pupa, (fig.) *Guen.* Spec. Gener. Phal., pl. 12.
1876. Larva, pupa, (figs.) *Packard,* (quotes Guen.) Monogr. Geometr., p. 348, pl. 13.
1879. Larva, cocoon. *L. W. Goodell.* Canad. Entom., vol. 11, p. 194.
1880. Egg, young larva. *L. W. Goodell.* Canad. Entom., vol. 12, p. 235.
FOOD PLANT. *Rhexia lutea.*

Acidalia ordinata. Walk.
1876. Larva, pupa, (figs.) *Packard,* (after Abbot's MS. drawing.) Monogr. Geometr., p. 565, pl. 13.
FOOD PLANT. *Trillium stylosum.*

Stegania pustularia. Guen.
1871. Larva. *Saunders.* Canad. Entom., vol. 3, p. 225.
1876. Larva, pupa, (figs.) *Packard,* (after Abbot's MS. drawing.) Monogr. Geometr., p. 310, pl. 13, (quotes Saunders.)
1881. Larva. *Packard,* (quotes Saunders.) Ins. Inj. Forest Trees, p. 112.
FOOD PLANT. *Acer.*

Eumacaria brunnearia. Packard.
1878. Larva. *L. W. Goodell.* Canad. Entom., vol. 10, p. 66.
1885. Larva, pupa. *D. Kellicott.* Canad. Entom., vol. 17, p. 32.
FOOD PLANT. *Prunus.*

Semiothisa præatomata. Haworth.
1857. Larva. *Guen.* Spec. Gener. Phal., vol. 2, p. 76.
1876. Larva. *Packard,* (quotes Guen.) Monogr. Geometr., p. 293.
FOOD PLANT. *Vaccinium.*

Semiothsia enotata. Guen.

1876. Larva, pupa, (figs.) *Packard*, (from Abbot's MS. drawing.) Monogr. Geometr., p. 564, pl. 13.

FOOD PLANT. *Lactuca grandifolia.*

Thamnonoma travaria. Linn.

1829. Larva. *Stephens.* Ill. Brit. Entom., Haust., vol. 3, p. 194.
1857. Larva. *Guen.* Spec. Gener. Phal., vol. 2, p. 93.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 56.
1859. Larva, (col'd fig.) *Humphreys.* Gen. Brit. Moths, pl. 31.
1870. Larva. *Packard*, (quotes Guen.) Inj. Ins. (new or little known), p. 12.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 318.

FOOD PLANT. *Ribes.*

Thamnonoma brunneata. Thunb.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 62.

FOOD PLANT. *Vaccinium.*

Eufitchia ribearia. Fitch.

1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 427.
1865. Larva. *B. D. Walsh.* Practical Entom., p. 22.
1869. Larva. *Harris.* Entom. Corres., p. 320.
1871. Larva, pupa, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 374.
1873. Larva, pupa, (fig.) *A. J. Cook.* 12th Rept. Michigan Agr. Soc., p. 143.
1874. Egg, larva, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 19.
1874. Larva. *Saunders.* Canad. Entom., vol. 6, p. 138.
1875. Larva, pupa, (figs.) *Saunders.* Rept. Entom. Soc Ontario, p. 33.
1876. Larva, (fig.) *Packard.* Monogr. Geometr., p. 248, pl. 13.
1877. Larva, pupa, (figs.) *Packard.* Ins. Inj. West, Hayden's Rept., p. 191.
1877. Lava, pupa. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 237.
1877. Larva, (fig.) *Packard.* Half-hours with Insects, p. 51.
1877. Egg, larva, pupa, (fig.) *Riley.* 9th Missouri Rept., p. 3.
1878. Larva, pupa, (fig.) *G. H. Perkins.* 5th Rept. Vermont Board Agr., p. 263.
1882. Larva, pupa, (fig.) *Bethune.* 12th Rept. Entom. Soc. Ontario, p. 83.
1883. Larva, pupa, (fig.) *T. J. Edge.* Agr. Pennsylv., p. 74.
1883. Egg, larva, pupa, (fig.) *Saunders.* Ins. Inj. Fruits, p. 345.
1888. Larva, pupa, (figs.) *Bethune.* 18th Rept. Entom. Soc. Ontario, p. 56.

FOOD PLANT. *Ribes.*

Caripeta angustiorata. Walker.

1884. Larva, pupa. *Packard.* Amer. Naturalist, vol. 18, p. 1015.

FOOD PLANT. *Pinus.*

Eidonia notataria. Walker.

Aspilates dissimilaria. Hübn.

1857. Larva, pupa. *Guen.* Spec. Gener. Phal., vol. 2, p. 182.
1876. Larva, pupa. *Packard*, (quotes Guen.) Monogr. Geometr., p. 209.
1876. Larva, pupa, (figs.) *Packard*, (after Abbot's MS. drawings.) Monogr. Geometr., pl. 13.

FOOD PLANT. *Trifolium.*

Euaspilates spinataria. Pack.

1887. Larva, (brief.) *D. Bruce.* Entom. Amer., vol. 3, p. 19.

Cleora pulchraria. Minot.

1870. Larva, pupa. *Packard.* Inj. Ins. (new or little known), p. 14.
1876. Larva, pupa, (figs.) *Packard.* Monogr. Geometr., p. 153, pl. 13.
1881. Larva, pupa. *Packard*, (quotes Saunders in lit.) Ins. Inj. Forest Trees, p. 205.
1886. Larva, pupa. *Packard.* Rept. Entom. Dept. Agr., p. 328.

FOOD PLANT. *Pinus.*

Stenotrachelys approximaria. Hübn.

1857. Larva. *Guen.*, (after Abbott's MS. drawing.) Spec. Gener. Phal., vol 1, p. 290.
1876. Larva. *Packard*, (quotes Guen.) Monogr. Geometr., p. 449.
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 49.

FOOD PLANTS. *Smilax, Quercus, etc.*

Epimecis hortaria. Fab.

1797. Larva, (col'd fig.) *Abbot—Smith*, (as Ph. liriodendraria.) Lep. Ins. Georgia, p. 203, pl. 102
1876. Larva. *Packard*, (after Abbot's MS. drawing.) Monogr. Geometr., p. 445.

FOOD PLANT. *Liriodendron tulipifera.*

Ceratonyx satanaria. Guen.

1853. Larva, (col'd fig.) *Guen.* Spec. Gener. Phal., vol. 1, p. 194, pl. 2.
1876. Larva. *Packard*, (quotes Guen.) Monogr. Geometr., p. 565.

FOOD PLANTS. *Liquidambar, Quercus.*

Cymatophora larvaria. Guen.

1874. Larva. *Saunders.* Canad. Entom., vol. 6, p. 31.
1876. Larva, pupa, (fig.) *Packard.* Monogr. Geometr., p. 438, pl. 13.

FOOD PLANT. *Prunus.*

Cymatophora pampinaria. Guen.

1876. Larva, pupa. *Packard*, (quotes L. W. Goodell in lit.) Monogr. Geometr., p. 435.
1881. Larva. *French.* Papilio, vol. 1, p. 82.

FOOD PLANT. *Pyrus.*

Cymatophora humaria. Guen.

1876. Larva, pupa, (fig.) *Packard*, (after Abbot's MS. drawing.) Monogr. Geometr., p. 437, pl. 13.

Cymatophora crepuscularia. Tr.

1857. Larva, pupa. *Guen.* Spec. Gener. Phal., vol. 1, p. 260.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths., vol. 2, p. 28.
1876. Larva. *Packard*, (quotes Guen.) Monogr. Geometr., p. 425.
1878. Larva. *L. W. Goodell.* Canad. Entom., vol. 10, p. 67.

FOOD PLANTS. *Salix, Populus, Alnus, etc.*

Paraphia subatomaria. Guen.

1876. Larva, (brief.) *Packard*, (quotes Saunders in lit.) Monogr. Geometr., p. 418.
1881. Larva, (brief.) *Packard.* Ins. Inj. Forest Trees, p. 205.

FOOD PLANT. *Pinus.*

Paraphia unipunctaria. Haworth.

1857. Larva, pupa, (brief.) *Guen.*, (from Abbot's MS. drawing.) Spec. Gener. Phal., vol. 2, p. 62.

1858. Larva. *Fitch*, (as A. triplipunctata.) 5th Rept. Ins. N. York, p. 825.
1876. Larva, pupa. *Packard*, (quotes Guen.) Monogr. Geometr., p. 417.
1881. Larva. *Packard*. Ins. Inj. Forest Trees, p. 48.
FOOD PLANT. *Quercus*.

Paraphia deplanaria. Guen.
1884. Larva, pupa. *Packard*. Amer. Naturalist, vol. 18, p. 935.
1886. Larva, pupa. *Packard*. Rept. Entom. U. S. Dept. Agr., p. 328.
FOOD PLANT. *Abies*.

Biston ursarius. Walk.
1876. Life history. *G. J. Bowles*. Canad. Entom., vol. 8, p. 7.
1881. Larva. *Packard*, (quotes Bowles.) Ins. Inj. Forest Trees, p. 121.
FOOD PLANT. *Populus*.

Eubyja cognataria. Guen.
1871. Larva. *G. J. Bowles*. Canad. Entom., vol. 3, p. 11.
1871. Larva, pupa. *Saunders*. Rept. Entom. Soc. Ontario, p. 379.
1872. Larva. *Lintner*. 26th Rept. N. York State Cab. N. Hist., p. 166.
1876. Larva, pupa, (brief.) *Packard*. Monogr. Geometr., p. 414.
1878. Larva. *L. W. Goodell*. Canad. Entom., vol. 10, p. 67.
1883. Larva. *Edwards—Elliot*. Papilio, vol. 3, p. 136.
1883. Egg. *A. W. P. Cramer*. Bull. Brooklyn Entom. Soc., vol. 6, p. 48.
1885. Larva, (fig.) *Lintner*. 2d Rept. N. York State Entom., p. 99.
FOOD PLANTS. *Acer*, *Ribes*, *etc.*

Eubyja quernaria. Abb.-Sm.
1797. Larva, (col'd fig.) *Abbot—Smith*. Lep. Ins. Georgia, p. 205, pl. 103.
1854. Larva, pupa, (figs.) *Emmons*. Nat. Hist. N. York, vol. 5, p. 246, pl. 36.
1857. Larva. (?) *Guen*. Spec. Gener. Phal., vol. 1, p. 206.
1876. Larva. *Packard*, (after Abbot's MS. drawing.) Monogr. Geometr., p. 412.
FOOD PLANTS. *Quercus*, *Cratægus*, *etc.*

Hybernia tiliaria. Harris.
1841. Larva. *Harris*. Ins. Inj. Vegetat., 1st edit., p. 342.
1852. Egg, larva. *Harris*. Ins. Inj. Vegetat., 2d edit., p. 369.
1856. Larva. *Fitch*. 3d Rept. Ins. N. York, p. 313.
1862. Egg, larva. *Harris*. Ins. Inj. Vegetat., Flint's edit., p. 472.
1864. Larva. *Jaeger*. Life N. Amer. Ins., p. 175.
1876. Larva. *Packard*, (quotes Harris.) Monogr. Geometr., p. 410.
1880. Larva. *Coquillett*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 149.
1880. Larva, (fig.) *J. H. Comstock*, (quotes Coquillett.). Rept. Entom. U. S. Dept. Agr., p. 255.
1881. Larva, (fig.) *Packard*, (after Comstock.) Ins. Inj. Forest Trees, p. 125.

1850. **Larva.** *Harris.* N. Engl'd Farmer, ser. 2, vol. 2, p. 252.
1851. **Larva.** *Harris.* Massachusetts Ploughman, vol. 10, Nos. 8, 33.
1852. **Larva.** *Harris.* N. Engl'd Farmer, ser. 4, vol. 4, p. 155.
1852. **Life history.** *Harris.* Ins. Inj. Vegetat., 2d edit., p. 359.
1854. **Larva** *Harris.* N. Engl'd Farmer, ser. 8, vol. 6, p. 363.
1856. **Larva.** *Fitch.* 3d Rept. Ins. N. York, p. 342.
1862. **Life history,** (figs.) *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 462.
1862. **Larva,** (fig.) *Packard.* 7th Rept. Maine Board Agr., p. 173.
1864. **Larva.** *Jaeger.* Life N. Amer. Ins., p. 175.
1867. **Larva.** *Tenney.* Nat. Hist., p. 407.
1869. **Larva,** (fig.) *Packard.* Guide to Study of Ins., p. 324, pl. 8.
1870. **Egg, larva.** *T. Glover.* Rept. U. S. Dept. Agr., p. 85.
1870. **Life history,** (figs.) *Riley.* 2d Missouri Rept., p. 94.
1872. **Life history,** (figs.) *Le Baron,* (after Riley.) 3d Illinois Rept.
1873. **Egg, larva,** (figs.) *A. J. Cook.* 12th Rept. Michigan Board Agric., p. 129.
1875. **Egg, larva,** (figs.) *Riley.* 7th Missouri Rept., p. 80.
1875. **Egg, larval stages, pupa,** (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 25.
1876. **Egg, larva, pupa.** *Packard,* (quotes Peck.) Monogr. Geometr., p. 403.
1876. **Larva, pupa,** (figs.) *Packard.* Monogr. Geometr., p. 405, pl. 13.
1876. **Larva, pupa.** *G. H. Perkins.* 2d Rept. Vermont Board Agric., p. 591.
1876. **Life history.** *C. Thomas.* Trans. Dept. Agr. Ill., vol. 14, p. 16.
1877. **Egg, larva, pupa,** (figs.) *C. Thomas.* Trans. Dept. Agr. Ill., vol. 15, p. 110.
1877. **Larva.** *French.* Trans. Dept. Agr. Ill., vol. 15, p. 237.
1877. **Larva, pupa,** (figs.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 791.
1877. **Egg, larva.** *Packard.* Half-hours with Insects, p. 173.
1881. **Egg, larva,** (figs.) *Packard,* (after Riley.) Ins. Inj. Forest Trees, p. 61.
1882. **Life history,** (figs.) *Riley.* 3d Rept. U. S. Entom. Comm., p. 157.
1882. **Life history,** (brief.) *Bethune,* (quotes Saunders.) 12th Rept. Entom. Soc. Ontario, p. 84.
1883. **Life history,** brief, (figs.) *Saunders.* Ins. Inj. Fruits, p. 67.
1885. **Egg, larva,** (figs.) *J. Fletcher.* Rept. Entom. Dept. Agr. Ontario, p. 23.
1885. **Larva.** *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 446.

FOOD PLANTS. *Ulmus, Pyrus,* and many other trees.

Anisopteryx autumnata. Packard. = **pometaria.** Mann.

1841. **Larva.** *Harris.* Ins. Inj. Vegetat., 1st edit., p. 333.
1875. **Egg, larva,** (figs.) *Riley.* 7th Missouri Rept., p. 83.
1875. **Egg, larva, pupa,** (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 26.
1876. **Egg, larva, pupa,** (figs.) *Packard.* Monogr. Geometr., p. 401, pl. 13.
1876. **Larva,** (brief.) *G. H. Perkins.* Rept. Vermont Board Agr., p. 595.
1877. **Larva.** *French.* Trans. Dept. Agr. Ill., vol. 15, p. 239.
1877. **Egg, larva, pupa,** (figs.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 793.
1880. **Egg, larva, pupa,** (figs.) *Coquillett,* (quotes French.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 148.
1880. **Life history,** (figs.) *Riley.* 3d Rept. U. S. Entom. Comm., p. 157.
1883. **Egg, larva, pupa,** (figs.) *Saunders.* Ins. Inj. Fruits, p. 65.
1885. **Egg, larva,** (figs.) *J. Fletcher.* Rept. Entom. Dept. Agr. Ontario, p. 23.
1885. **Egg, larva.** *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 446.

FOOD PLANTS. *Pyrus, Ulmus,* and other trees.

Heterophleps triguttata. H. Sch.

1876. **Larva.** *Packard,* (quotes Saunders in lit.) Monogr. Geometr., p. 191.

FOOD PLANT. *Acer.*

Hydria undulata. Linn.

1859. **Larva.** *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 110.
1859. **Larva,** (brief.) *Humphreys.* Genera Brit. Moths, p. 111.
1869. **Life history.** *Brauchamp.* Newman's Brit. Moths, p. 179.

1870. Life history. *Fitch.* 14th Rept. Ins. N. York, p. 355.
1876. Larva. *Packard,* (quotes Beauchamp.) Monogr. Geometr., p. 173.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 378.
FOOD PLANTS. *Prunus, Salix, etc.*

Rheumaptera fluctuata. Linn.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 102.
1869. Larva. *Newman.* Brit. Moths, p. 164.
1876. Larva. *Packard,* (quotes Newman.) Monogr. Geometr., p. 157.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 378.
FOOD PLANTS. *Cruciferæ.*

Rheumaptera unangulata. Haworth.

1869. Larva. *Newman.* Brit. Moths, p. 159.
1876. Larva. *Packard,* (quotes Newman.) Monogr. Geometr., p. 160.
FOOD PLANT. *Alsine media.*

Rheumaptera tristata. Linn.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 100.
1859. Larva, (col'd fig.) *Humphreys.* Genera Brit. Moths, pl. 43.
1869. Larva. *Newman.* Brit. Moths, p. 157.
1876. Larva. *Packard,* (quotes Newman's Brit. Moths.) Monogr. Geometr., p. 163.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 380.
FOOD PLANT. *Galium.*

Rheumaptera hastata. Linn.

1829. Larva. *Stephens.* Illus. Brit. Entom., Haust., vol. 3, p. 249.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 100.
1859. Larva, (col'd fig.) *Humphreys.* Genera Brit. Moths, pl. 43.
1860. Larva, (brief.) *Duncan.* Natural. Library, vol. 30, p. 256.
1869. Larva. *Newman.* Brit. Moths, p. 157.
1872. Larva. *J. G. Wood.* Insects at Home, p. 458.
1876. Larva. *Packard,* (quotes Newman.) Monogr. Geometr., p. 165.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 380.
1885. Larva, (fig.) *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 447.
FOOD PLANTS. *Betula, Myrica.*

Ochyria ferrugata. Linn.

1887. Larva, (fig.) *J. Fletcher.* Rept. Entom. Dept. Agr. Canad., p. 30.
1888. Larva, (fig.) *J. Fletcher.* Rept. Entom. Bot. Dept. Agr. Canada, p. 30.
FOOD PLANTS. *Vitis, Ampelopsis, etc.*

Petrophora testata. Linn.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 114.
1869. Larva. *Newman.* Brit. Moths, p. 191.
1876. Larva. *Packard,* (quotes Newman.) Monogr. Geometr., p. 123.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 370.
FOOD PLANTS. *Populus, Salix, Betula.*

Petrophora prunata. Linn.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 114.
1859. Larva, pupa, (col'd figs.) *Humphreys.* Genera Brit. Moths, pl. 40.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 370.
FOOD PLANT. *Ribes.*

Petrophora truncata. Hübn.
1869. Life history. *Newman.* Brit. Moths, p. 186.
1876. Life history, (fig.) *Packard,* (quotes Newman.) Monogr. Geometr., p. 109, pl. 13.
FOOD PLANT. *Fragaria.*

Hydriomena sordidata. Fabr.
1869. Life history. *Newman.* Brit. Moths, p. 153.
1876. Larva, (fig.) *Packard,* (quotes Newman.) Monogr. Geometr., p. 99, pl. 13.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 381.
FOOD PLANT. *Salix.*

Thera contractata. Packard.
1885. Larva, pupa. *Packard.* Bulletin No. 12, Dept. Agr., p. 22.
FOOD PLANTS. *Pinus, Abies, Juniperus.*

Epirrita dilutata. Bork.
1858. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 812.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 77.
1869. Larva. *Newman.* Brit. Moths, p. 109.
1876. Larva, (fig.) *Packard,* (quotes Newman.) Monogr. Geometr., p. 88, pl. 13.
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 63.
FOOD PLANTS. *Prunus, Quercus, Ulmus, etc.*

Epirrita cambricaria. Curtis.
1869. Larva. *Newman.* Brit. Moths, p. 76.
1876. Larva. *Packard,* (quotes Newman.) Monogr. Geometr., p. 86.
FOOD PLANT. *Pyrus aucuparia.*

Plemyria fluviata. Hübn.
1858. Life history. (*Anonymous.*) Entomologist's Intelligencer.
1868. Life history, (figs.) *Milliere.* Ann. Linn. Soc. Lyons, p. 50, pl. 90.
1869. Life history. *Newman.* British Moths.
1876. Life history, (figs.) *Packard,* (quotes Newman.) Monogr. Geometr., p. 78, pl. 13.
1876. Life history. *Packard,* (quotes Milliere.) Monogr. Geometr., p. 564.
FOOD PLANTS. *Anthemis, Chrysanthemum.*

Glaucopteryx cæsiata. Borth.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 78.
1869. Life history. *Newman.* Brit. Moths, p. 110.
1876. Life history, (fig.) *Packard,* (quotes Newman.) Monogr. Geometr., p. 69, pl. 13.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 383.
FOOD PLANTS. *Ericaceæ.*

Glaucopteryx magnoliata. Packard. = **cumatilis.** G. and R.
1875. Larva, pupa. *Hy. Edwards.* Proc. Cal. Acad. Sc., April.
FOOD PLANTS. *Fuschia, Geranium, etc.*

Eupithecia miserulata. Grote.

1876. Larva, pupa, (figs.) *Packard.* Monogr. Geometr., p. 54, pl. 13.
1881. Larva, pupa. *Packard.* Ins. Inj. Forest Trees, p. 248.
FOOD PLANT. *Juniperus.*

Eupithecia interruptofasciata. Packard.

1881. Larva. *Coquillett.* Papilio, vol. 1, p. 56.
1883. Larva, pupa. *Saunders.* Ins. Inj. Fruits, p. 352.
FOOD PLANTS. *Trifolium, etc.*

Eupithecia zygadeniata. Pack.

1876. Larva. *Packard,* (quotes Belfrage in lit.) Monogr. Geometr., p. 52.
FOOD PLANT. *Zygadenus nuttallii.*

Eupithecia absynthiata. Linn.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 69.
1869. Larva. *Crewe.* Newman's Brit. Moths, p. 136.
1876. Larva, (fig.) *Packard,* (quotes Crewe.) Monogr. Geometr., p. 50, pl. 13.
1877. Larva, pupa. *L. W. Goodell.* Canad. Entom , vol. 9, p. 62.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 403.
FOOD PLANTS. Various species of *Compositæ.*

Exelis pyrolaria. Guen.

1857. Larva. *Guen.* Spec. Gener., vol. 1, p. 324.
1876. Larva. *Packard,* (quotes Guen.) Monogr. Geometr., p. 565.
FOOD PLANT. *Pyrola.*

PYRALIDÆ.

Omphalocera cariosa. Lederer.

1880. Larva, cocoon. *French,* (as amphaloma.) 6th Rept. Ill. State Norm. Univer., p. 46.
FOOD PLANT. *Anoma triloba.*

Asopia farinalis. Linn.

1841. Larva. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 343.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 134.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 247.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 157.
1882. Larva. *W. F. Kirby.* Europ. Butt. and Moths, p. 410.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 444.
FEEDS on corn, meal, etc.

Asopia costalis. Fabr.

1870. Larva, pupa, (figs.) *T. Glover.* Rept. U. S. Dept. Agr., p. 84.

Botis penitalis. Grote.

1880. Larva. *Coquillett.* Canad. Entom., vol. 12, p. 45.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 154.
FOOD PLANT. *Apocynum.*

Botis magistralis. Grote.

1888. Larva. *W. Beutenmüller.* Canad. Entom., vol. 20, p. 15.
FOOD PLANT. *Clethra alnifolia.*

Botis oscitalis. Grote.

1883. Larva. *Coquillett.* Papilio, vol. 3, p. 101.
FOOD PLANTS. *Salix, Populus.*

Botis syringicola. Packard.

1870. Larva, (brief.) *Packard.* Inj. Ins., new or little known, p. 18.
FEEDS in stems of *Syringa.*

Agathodes designalis. Guen.

1854. Larva. *Guen.*, (after Abbot's MS. drawing.) Spec. Gener. Delt. Pyr., vol. 8, p. 209.
FOOD PLANTS. *Asclepias, Salix.*

Eurycreon rantalis. Guen.

1882. Larva, (brief.) *Lintner.* 41st Rept. N. York State Agr. Soc., p. 49.
1885. Larva, pupa, (figs.) *Riley.* Rept. U. S. Dept. Agr., p. 265, pl. 4, fig. 3.
FOOD PLANTS. *Amaranthus, Ambrosia,* and various cult. crops.

Mesographe rimosalis. Guen.

1879. Larva. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 17, Append, p. 38.
1880. Larva, cocoon. *C. Thomas.* Amer. Entom., vol. 1, 2d series, p. 22.
FOOD PLANT. *Brassica.*

Mesographe stramentalis. Hübn.

1869. Larva, (fig.) *Harris,* (as B. sumalis.) Entom. Corres., p. 322.
1872. Larva. *Lintner.* 26th Rept. N. York State Cab. N. Hist., p. 164.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 445.
FOOD PLANT. *Cochlearia armoracia,* (Horse-radish.)

Pantographa limata. G. and R.

1884. Larva. *Fernald.* Canad. Entom., vol. 16, p. 27.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 445.
FOOD PLANT. *Tilia americana.*

Eudioptis hyalinata. Linn.

1832. Larva, pupa, (col'd figs.) *Poey.* Lep. Cubana, pl. 19.
1854. Larva. *Guen.* Spec. Gener. Delt. Pyral., vol, 8, p. 296.
1875. Larva, pupa, (figs.) *C. R. Dodge.* Field and Forest, vol. 1, p. 9.
1880. Life history. *J. E. Willett.* Rept. Entom. Dept. Agr., p. 219.
1880. Life history. *J. H. Comstock,* (quotes Willet.) Loc cit., p. 218,
1883. Larva, pupa, (figs.) *Saunders.* Canad. Entom., vol. 15, p. 56.
1883. Larva, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 24.
1883. Life history, (brief.) *Saunders.* Ins. Inj. Fruits, p. 365.
1883. Larva, (fig.) *T. J. Edge.* Agr. Pennsylv., p. 67.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 444.
FEEDS on fruits of *Cucurbitaceæ.*

Eudioptis nitidalis. Cramer.

1854. Larva. *Guen.* Spec. Gener. Delt. Pyral., vol. 8, p. 300.
1870. Life history, (figs.) *Riley.* 2d Missouri Rept, p. 67.
1870. Larva, pupa, (figs.) *T. Glover.* Rept. Dept. Agr., p. 84.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 251.
1877. Larva, pupa, (figs.) *Packard,* (after Riley.) Inj. Ins. West, Hayden's Rept., p. 772.
1883. Larva, pupa. *Saunders.* Ins. Inj. Fruits, p. 368.
1883. Larva, (fig.) *T. J. Edge,* (after Riley.) Agr. Pennsylv., p. 65.

1885. Larva, (fig.) *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 444.
FEEDS on fruits of *Cucurbitaceæ.*

Desmia maculalis. Westwood.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 401.
1871. Life history, (figs.) *Riley.* 3d Missouri Rept., p. 61.
1871. Larva, pupa, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 358.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 249.
1878. Larva, pupa, (fig.) *G. H. Perkins.* 5th Rept. Vermont Board Agr., p. 277.
1881. Larva. *W. W. Goldsmith.* Rept. Kentucky Bureau Agr., p. 251.
1883. Egg, larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 267.
FOOD PLANT. *Vitis.*

Zinckenia perspectalis. Hübn.
1854. Larva. *Guen.* Spec. Gener. Delt. Pyral., vol. 8, p. 226.
FOOD PLANT. *Lilium canadense.*

Clydonopteron tecomæ. Riley.
1880. Larva, pupa, (figs.) *Riley.* Amer. Entom., vol. 1, 2d ser., p. 286.
FEEDS in seed-pods of *Tecoma radicans.*

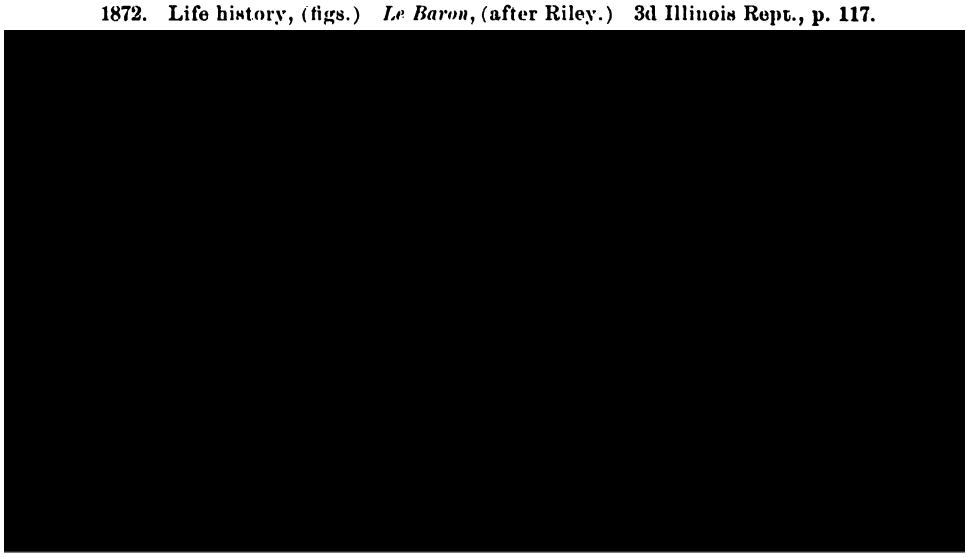
Margarodes quadristigmalis. Guen.
1888. Life history. *Howard—Lugger.* Ins. Life, vol. 1, p. 22.
FOOD PLANT. *Ligustrum vulgare.*

Hydrocampa formosalis. Clemens.
1884. Larva, pupa, (figs.) *Packard.* Amer. Naturalist, vol. 18, p. 824, pl. 24.

Pinipestis zimmermanni. Grote.
1877. Life history. *Grote.* Canad. Entom., vol. 9, p. 161.
1877. Larva, cocoon, pupa. *Grote.* Rept. Entom. Soc. Ontario, p. 13.
1878. Larva, pupa. *Zimmerman.* Canad Entom., vol. 10, p. 20.
1879. Larva. *D. S. Kellicott.* Canad. Entom., vol. 11, p. 114.
1881. Larva, cocoon. *Packard,* (quotes Grote–Kellicott.) Ins. Inj. Forest Trees, p. 182.
FOOD PLANT. Species of *Pinus.*

Phycis rubrifasciella. Packard.
1873. Larva, pupa. *Packard.* Amer. Lyceum N. Hist. N. York, vol. 10, p. 268.
1889. Larva. *W. Beutenmüller.* Entom. Amer., vol. 5, p. 38.

Phycis indiginella. Zeller. = **nebulo.**
1863. Larva. *B. D. Walsh.* Proc. Boston Soc. N. Hist., vol. 9, p. 312.
1869. Larva, case. *Walsh.* 1st Illinois Rept., p. 34.
1870. Larva. *Saunders.* Canad. Entom., vol. 2, p. 126.
1872. Life history, (figs.) *Riley.* 4th Missouri Rept., pp. 38–42.
1872. Life history, (figs.) *Le Baron,* (after Riley.) 3d Illinois Rept., p. 117.



Phycis caryæ. Grote.

1881. Larva, pupa. *Grote*, (quotes Coquillett in lit.) Papilio, vol. 1, p. 13.

FOOD PLANT. *Carya.*

Tetralopha (Saluda) melanogrammos. Guen.

1880. Larva, pupa. *Comstock.* Rept. U. S. Dept. Agr., p. 263.

1889. Larva, pupa. *Hulst*, (quotes Comstock.) Entom. Amer., vol. 5, p. 68.

FOOD PLANT. *Pinus tæda.*

Pempelia hammondi. Riley.

1872. Larva, pupa, (figs.) *Riley.* 4th Missouri Rept., p. 44.

1877. Larva, pupa. *French*, (quotes Riley.) Trans. Dept. Agr. Ill., vol. 15, p. 253.

1883. Larva, cocoon, figs. *Saunders.* Ins. Inj. Fruits, p. 100.

FOOD PLANT. *Pyrus.*

Dakruma convolutella. Hübn. = **grossulariæ.** Packard.

1869. Larva, pupa, (figs.) *Riley.* 1st Missouri Rept., p. 140.

1869. Larva, case, (fig.) *Packard.* Guide to Study of Ins., p. 331.

1871. Larva, case, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 383.

1876. Larva, case, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 39.

1877. Larva, case, (brief.) *B. Gott.* Rept. Entom. Soc. Ontario, p. 43.

1877. Larva. *French*, (quotes Packard.) Trans. Dept. Agr. Ill., vol. 15, p. 251.

1883. Larva, case, (figs.) *Saunders.* Ins. Inj. Fruits, p. 358.

1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 444.

FOOD PLANT. *Ribes.*

Dakruma coccidivora. Comstock.

1879. Life history. *J. H. Comstock.* Proc. Amer. Ass. Adv. Sc., vol. 28, p. 467.

1879. Life history, (figs.) *J. H. Comstock.* North Amer. Entom., No. 4, p. 27.

1879. Life history. *J. H. Comstock.* Rept. U. S. Dept. Agr., p. 243.

FEEDS on Homopterous larvæ, (*Coccidæ.*)

Dakruma pallida. Comstock.

1879. Larva. *Comstock.* Rept. U. S. Dept. Agr., p. 244.

FOOD PLANT. *Quercus.*

Anæglis demissalis. Lederer.

1885. Life history, (figs.) *Hubbard.* Ins. Affect. Orange, p. 155, pl. 13.

FOOD PLANT. *Citrus*, (Orange.)

Aphomia colonella. Linn. (Ilythia.)

1868. Pupa, (figs.) *Packard.* Amer. Naturalist, vol. 2, p. 333.

FEEDS on beeswax.

Galleria (Honora) **mellinella.** Fabr. = **cereana.**

1836. Larva, (col'd fig.) *Curtis.* Brit. Entom., vol. 13, pl. 587.

1840. Larva, (fig.) *Westwood.* Intr. Mod. Class. Ins., vol. 2, p. 411, fig. 113.

1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 357.

1852. Life history. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 384.

1854. Larva. *Emmons.* Nat. Hist. N. York, vol. 5, p. 253.

1857. Life history. *Chenu—Demarets.* Encyc. Hist. Nat. Papillons, vol. 2, p. 261.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 164.

1859. Larva, (col'd fig.) *Humphreys.* Gener. Brit. Moths, pl. 54.

1862. Life history. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 491.

1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 181.

1867. Larva. *Tenney.* Nat. Hist., p. 409.

1869. Life history, (figs.) *Riley.* 1st Missouri Rept., p. 166.

1872. Larva, (fig.) *J. G. Wood.* Insects at Home, p. 500.

1876. Larva, pupa, (figs.) *J. Williams.* Rept. Entom. Soc. Ontario, p. 46.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 253.

1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 443.

FEEDS on beeswax.

Ephestia elutella. Hübn.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 168.

FEEDS on dried fruit.

Ephestia interpunctella. Hübn.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths. vol. 2, p. 169.

FEEDS on dried fruits.

Crambus vulgivagellus. Clemens.

1882. Larva, pupa. *Lintner.* 41st Rept. N. York State Agr. Soc., p. 44.

1884. Larva, cocoon, (figs.) *H. A. Cutting.* 8th Rept. Vermont Board Agr., p. 276.

1885. Egg, larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 443.

FOOD PLANT. *Gramineæ.*

Crambus exsiccatus. Zeller.

1888. Life history. *H. Osborn.* Rept. Entom. Dept. Agr., p. 154.

Diaætria saccharalis. Fabr.

1881. Larva, pupa, (figs.) *J. H. Comstock.* Rept. Ins. Inj. Sugar, U. S. Dept. Agr., p. 9.

FEEDS on sugar-cane.

TORTRICIDÆ.

Teras hastiana. Linn.

1859. Larva, (brief.) *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 233.

FOOD PLANT. *Salix.*

Teras viburnana. Clem.

1886. Pupa. *Packard.* Rept. Entom. U. S. Dept. Agr., p. 332.

Teras permutana. Dupon.

1881. Larva. *Coquillett.* Papilio, vol. 1, p. 30.

1883. Larva. *Coquillett.* Papilio, vol. 3, p. 100.

FOOD PLANT. *Salix.*

Teras ferrugana. Schiff.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 235.

FOOD PLANT. *Betula.*

Teras occycoceana. Packard.

1881. Egg. *Riley.* Papilio, vol. 1, p. 110.

Teras cinderella. Riley.

1872. Larva, pupa, (figs.) *Riley.* 4th Missouri Rept., p. 46.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 255.

1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 98.

FOOD PLANT. Pyrus (Apple.)

1856. Larva. *Fitch.* 3d Rept. Ins. N. York, pp. 346, 358.
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 480.
1869. Larva. *Packard.* Guide to Study of Ins., p. 335.
1871. Larva, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 379.
1873. Larva, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 14.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 256.
1877. Larva. *Packard.* Half-hours with Insects, p. 61.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 153.
1883. Larva. *Coquillett.* Papilio, vol. 3, p. 100.
1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 90.
1885. Larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 441.
FOOD PLANTS. *Rosa, Pyrus, etc.*

Cacœcia rosana. Linn.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 204.
FOOD PLANTS. *Rosa, etc.*

Cacœcia cerasivorana. Fitch.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 382.
1883. Larva. *Coquillett.* Papilio, vol. 3, p. 102.
1883. Larva. *Saunders.* Ins. Inj. Fruits, p. 215.
1885. Egg, larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 441.
FOOD PLANT. *Cerasus virginiana.*

Cacœcia rileyana. Grote.
1869. Life history, (figs.) *Riley.* 1st Missouri Rept., p. 153.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 256.
1881. Larva. *Packard,* (quotes Riley.) Ins. Inj. Forest Trees p. 82.
FOOD PLANTS. *Carya, Symphoricarpus, etc.*

Cacœcia argyrospila. Walker.
1879. Pupa, (brief.) *Walsingham.* Illus. Lep. Heteroc. B. Mus., vol. 4, p. 9.
1886. Larva, pupa. *Packard.* Rept. U. S. Dept. Agr., p. 330.
FOOD PLANTS. Various trees and shrubs.

Cacœcia semiferana. Walker.
1883. Larva. *Coquillett.* Papilio, vol. 3, p. 100.
FOOD PLANT. *Polygonum.*

Cacœcia fervidana. Clemens.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 154.
FOOD PLANTS. *Cerasus, Quercus.*

Loxotænia afflictana. Walker.
1879. Larva, (brief.) *Walsingham.* Lep. Heteroc. B. Mus., vol. 4, p. 15.
FOOD PLANT. *Abies.*

Ptycholoma persicana. Fitch.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 357.
1883. Larva. *Saunders.* Ins. Inj. Fruits, p. 197.
FOOD PLANT. *Pernica vulgaris,* (Peach.)

Lophoderus ministrana. Linn.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 192.
FOOD PLANT. *Corylus.*

Lophoderus triferana. Walker.
1870. Larva. *Packard.* Inj. Ins., new or little known, p. 8.
FOOD PLANT. *Oecyocoecus.*

Tortrix quercifoliana. Fitch.
1858. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 826.
1877. Larva, pupa. *Emma A. Smith.* Trans. Dept. Agr. Ill., vol. 15, p. 114.
1879. Larva, pupa, (figs.) *C. Thomas.* Trans. Dept. Agr. Ill., vol. 17, Append., p. 142.
1880. Larva. *Coquillett.* Papilio, vol. 3, p. 100.
FOOD PLANT. *Quercus.*

Tortrix fumiferana. Clemens.

1885. Egg, larva. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 442.

FOOD PLANTS. *Abies, etc.*

Tortrix pallorana. Robinson.

1883. Larva. *Coquillett.* Papilio, vol. 3, p. 100.

FOOD PLANTS. *Verbena, Cerasus, etc.*

Tortrix bergmanniana. Linn.

1837. Life history, (figs.) *Westwood.* London's Gardeners' Magazine, No. 90.

1840. Larva, pupa, (figs.) *Westwood.* Intr. Mod. Class. Ins., vol. 2, p. 403, fig. 111.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 228.

FOOD PLANT. *Rosa.*

Synnoma linosyrana. Walsingham.

1879. Larva, cocoon. *Walsingham.* Illus. Lep. Heteroc. B. Mus., vol. 4, p. 25.

FOOD PLANT. *Linosyris viscidiflora.*

Œnectra senecionana. Walsingham.

1879. Larva, (brief.) *Walsingham.* Illus. Lep. Heteroc. B. Mus., vol. 4, p. 17.

FOOD PLANT. *Senecio.*

Œnectra pilleriana. Schiff.

1857. Life history, (fig.) *Chenu—Demarets.* Encyl. Hist. Nat. Papillons, vol. 2, p. 242, pl. 32.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 197.

FEEDS in pods of *Iris.*

Cenopis reticulatana. Clemens.

1853. Larva. *Coquillett.* Papilio, vol. 3, p. 99.

FOOD PLANTS. *Geranium, Chenopodium.*

Dichelia sulfureana. Clemens.

1883. Larva. *Coquillett.* Papilio, vol. 3, p. 99.

1885. Larva. *Hubbard.* Ins. Affect. Orange, p. 154.

FOOD PLANTS. *Verbena, Pinus, Citrus.*

Platynota rostrana. Walker.

1883. Larva. *Saunders.* Ins. Inj. Fruits, p. 381.

1885. Larva, pupa, (fig.) *Hubbard.* Ins. Affect. Orange, p. 152.

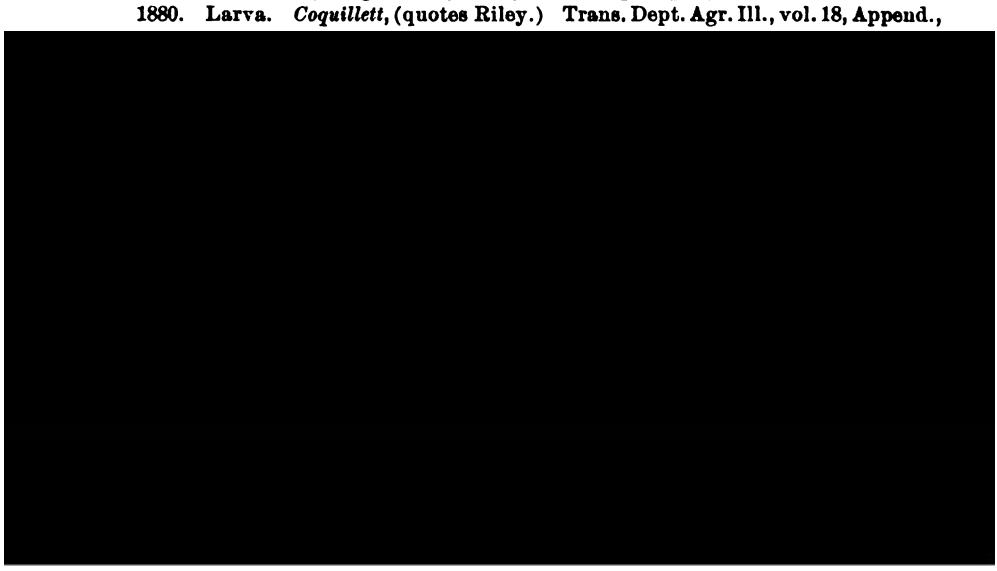
FOOD PLANTS. *Citrus, etc.*

Conchylis rutilana. Hübn.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 277.

1878. Life history, (fig.) *Riley.* Rept. U. S. Dept. Agr., p.

1880. Larva. *Coquillett,* (quotes Riley.) Trans. Dept. Agr. Ill., vol. 18, Append.,



1881. Larva, pupa, (figs.) *Packard*, (quotes Comstock.) Ins. Inj. Forest Trees, p. 189.
1883. Larva, (fig.) *Saunders*. Rept. Entom. Soc. Ontario, p. 58.
FOOD PLANT. *Pinus rigida*.

Eudemis botrana. Schiff. = **vitivorana.** Pack.
1869. Life history, (figs.) *Riley*. 1st Missouri Rept., p. 133.
1869. Larva. *Packard*. Guide to Study of Ins , p. 336.
1870. Larva, cocoon, (figs.) *T. Glover*, (quotes Riley) Rept U. S Dept. Agr., p. 86.
1877. Larva. *French*, (quotes Packard.) Trans. Dept. Agr. Ill., vol. 15, p. 257.
1881. Larva, pupa. *W. W. Goldsmith*, (quotes Riley.) Rept. Kentucky Bureau Agr., p. 257.
1882. Larva, (fig.) *Saunders*. Rept. Entom. Soc. Ontario, p. 67.
1882. Life history. *Saunders*. Canad. Entom., vol. 14, p. 178.
1883. Larva. *Coquillett*. Papilio, vol. 3, p. 102.
1883. Larva, pupa, (figs.) *Saunders*. Ins. Inj. Fruits, p. 299.
1883. Larva, (fig.) *Saunders*. Rept. Entom. Soc. Ontario, p. 26.
1883. Larva, (fig.) *T. J. Edge*. Agr. Pennsylv., p. 71.
FOOD PLANTS. *Vitis, Circium lanceolatum*.

Bactra lanceolana. Hübn.
1859. Larva. *H. T. Stainton*. Brit. Butt and Moths, vol. 2, p. 226.
FOOD PLANT. *Juncus*.

Eccopsis fagigemmæana. Chambers.
1878. Larva, case. *Chambers*. Canad. Entom., vol. 10, p. 75.
FOOD PLANT. *Fagus sylvatica*.

Eccopsis permundana. Clemens.
1883. Larva. *Saunders*. Ins. Inj. Fruits, p. 324.
1883. Larva. *S. A. Forbes*, (quotes Saunders.) Trans. Wisconsin Agr. Soc., p. 13.
1883. Larva. *Coquillett*. Papilio, vol. 3, p. 102.
1886. Larva, pupa *Packard*. Rept. Entom., Dept. Agr., p. 331.
FOOD PLANTS. *Rosa, Spiræa, Corylus*.

Eccopsis versicolorana. Clem.
1886. Pupa. *Packard*. Rept. Entom. U. S. Dept. Agr., p. 331.

Eccopsis fasciatana. Clemens.
1880. Larva. *Coquillett*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 153.
FOOD PLANT. *Rumex*.

Eccopsis malana. Fernald.
1883. Larva. *Saunders*. Ins. Inj. Fruits, p. 97.

Penthina nimbatana. Clemens.
1880. Larva. *Coquillett*. Trans. Dept. Agr. Ill., vol. 18, Append., p. 153.
1883. Larva. *Coquillett*. Papilio, vol. 3, p. 101.
FOOD PLANT. *Rosa blanda*.

Penthina osmundana. Fernald.
1879. Larva, (brief.) *Fernald*. Canad. Entom., vol. 11, p. 157.
FOOD PLANT. *Osmunda regalis*.

Penthina capreana. Hübn.
1859. Larva, (brief.) *H. T. Stainton*. Brit. Butt. and Moths, vol. 2, p. 194.
FOOD PLANT. *Salix*.

Penthina hebesana. Walker.
1883. Larva. *Coquillett*. Papilio, vol. 3, p. 101.
FOOD PLANT. *Stachys palustris*.

Penthina cyanana. Murtfeldt.
1880. Larva, pupa. *Mary E. Murtfeldt*. Amer. Entom., vol. 1, 2d ser., p. 15.

Psadisca saligneana. Clemens.
1870. Larva, (figs.) *Riley*. 2d Missouri Rept., p. 134.

1878. Larva, pupa. *D. Kellicott.* Canad. Entom., vol. 10, p. 202.
FOOD PLANT. *Solidago*, (forming galls).

Pædisca scudderiana. Clemens.
1882. Life history, (brief.) *D. Kellicott.* Canad. Entom., vol. 14, p. 161.
FOOD PLANT. *Solidago*, (forming galls.)

Semasia artemisiana. Walsingham.
1879. Larva, (brief.) *Walsingham.* Lep. Heteroc. B. Mus., vol. 4, p. 57.
FOOD PLANT. *Artemisia.*

Tmetocera ocellana. Schiff.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 349.
1852. Larva. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 377.
1856. Larva. *Fitch.* 3d Rept. Nox. Ins. N. York, p. 345.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 219.
1862. Larva. *Harris.* Ins. Inj. Vegetat., Flint's edit., p 482.
1870. Larva. *Packard.* Inj. Ins., new or little known, p. 1.
1871. Larva, (fig.) *E. B. Reed.* Rept. Entom. Soc. Ontario, p. 366.
1876. Larva. *G. H. Perkins.* 2d Rept. Vermont State Board Agr., p. 588.
1877. Larva. *Packard.* Half-hours with Insects, p. 181.
1883 Larva, (fig.) *Saunders.* Ins. Inj. Fruits, p. 95.
1885. Larva, (fig.) *J. Fletcher.* Rept. Entom. Dept. Agr Ontario, p. 24.
FOOD PLANTS. *Pyrus malus* and other trees.

Steganoptycha angustana. Hübn.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 191.
FOOD PLANT. *Salix.*

Steganoptycha claypoleana. Riley.
1883. Larva, (brief.) *Riley.* Papilio, vol. 3, p. 191.
FOOD PLANT. *Æsculus.*

Rhopobota vacciniana. Packard.
1869. Larva, pupa. *Packard.* Guide to Study of Ins., p. 339.
1870. Larva, cocoon. *T. Glover.* Rept. U. S. Dept. Agr., p. 85.
1883. Larva, pupa, (fig.) *Saunders.* Ins. Inj. Fruits, p. 369.
FOOD PLANT. *Vaccinium.*

Phoxopteris nubeculana. Clemens.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 153.
1883. Larva, (fig.) *Saunders.* Ins. Inj. Fruits, p. 90.

Carpocapsa pomonella. Linn.

1819. Life history. *J. Tufts.* Massachusetts Agr. Repository.
1832. Life history, (brief.) *Harris.* Trans. Mass. Hort. Soc., p. 42.
1837. Life history, (figs.) *Kollar.* Inj. Ins. (Loudon's edit.), p. 229.
1838. Life history, (brief.) *Westwood.* London's Gardeners' Magazine.
1840. Larval stages, pupa. *J. Burrelle.* N. Engl'd Farmer, vol. 18, p. 398.
1840. Larva, pupa, (col'd figs.) *Ratzeburg.* Die Forst-Insecten, vol. 2, p. 234, pl. 14.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 351.
1843. Larva. *W. Gaylord.* Trans. N. York State Agr. Soc., p. 158.
1843. Larva. *Harris.* N. Engl'd Farmer, vol. 22, p. 13.
1852. Life history. *Harris.* Ins. Inj. Vegetat., 2d edit., p. 379.
1855. Larva, pupa, (figs.) *Fitch.* 2d Rept. Ins. N. York, p. 221.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 347.
1857. Life history. *Chenu—Demarets.* Encyc. Hist. Nat. Papillons, vol. 2, p. 247.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 253.
1859. Larva, (col'd fig.) *Humphreys.* Gener. Brit. Moths, pl. 51.
1862. Life history. *Harris.* Ins. Inj. Vegetat., Flint's edit., p. 484.
1863. Larva, (figs.) *J. G. Wood.* Nat. Hist., vol. 2, p. 542.
1864. Larva. *Jaeger.* Life N. Amer. Ins., p. 179.
1865. Larva. *Walsh.* Practical Entom., p. 34.
1869. Life history, (figs.) *Riley.* 1st Missouri Rept., p. 62.
1869. Life history. *Walsh.* 1st Illinois Rept., p. 27.
1869. Larva, cocoon, (brief.) *Packard.* Guide to Study of Ins., p. 341.
1870. Larva, pupa, (figs.) *T. Glover.* Rept. U. S. Dept. Agr., p. 86.
1871. Larva, (fig.) *Saunders.* Canad. Entom., vol. 3, p. 27.
1871. Larva, pupa, (fig.) *Bethune.* Rept. Entom. Soc. Ontario, p. 355.
1873. Larva, cocoon, pupa, (figs.) *A. J. Cook.* 12th Rept. Michigan Board Agr., p. 123.
1873. Life history, (figs.) *Le Baron*, (after Riley.) 4th Ill. Rept., p. 167.
1874. Larva, cocoon, pupa, (figs.) *Saunders.* Rept. Entom. Soc. Ontario, p. 42.
1876. Larva, cocoon, pupa, (figs.) *G. H. Perkins.* 3d Rept. Vermont Board Agr., p. 583.
1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 260.
1877. Larva, cocoon, pupa. *Packard.* Half-hours with Ins., p. 191.
1877. Larva, pupa, (fig.) *Packard.* Ins. Inj. West, Hayden's Rept., p. 734.
1877. Larva, cocoon, pupa, (fig.) *B. Gott.* Rept. Entom. Soc. Ontario, p. 46.
1878. Larva, cocoon, pupa, (fig.) *S. S. Rathvon.* Agr. Pennsylv., p. 605.
1879. Larva, pupa, (fig.) *H. Cutting.* Rept. N. Hampshire Board Agr., p. 24.
1880. Larva, cocoon, pupa, (figs.) *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 151.
1882. Life history, (brief.) *Bethune.* 12th Rept. Entom. Soc. Ontario, p. 76.
1882. Larva, (col'd fig.) *W. F. Kirby.* Europ. Butt. and Moths, p. 413, pl. 62.
1883. Larva, cocoon, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 129.
1883. Larva, cocoon, pupa, (figs.) *S. S. Rathvon.* Agr. Pennsylv., p. 50.
1885. Egg, larva, cocoon. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 442.
1885. Larva. *Lintner.* Rept. Massachusetts Board Agr., p. 184.
1885. Larva, cocoon, pupa, (figs.) *A. J. Cook.* 24th Rept. Michigan Board Agr., p. 171.
1877. Larva, pupa, (figs.) *J. Fletcher.* Rept. Entom. Dept. Agr. Canad., p. 19.
1888. Larva, pupa, (figs.) *J. Fletcher.* Rept. Bot. Entom. Canad., p. 19.
1888. Life history, (col'd figs.) *L. O. Howard.* Rept. Entom. Dept. Agr., p. 68, pl. 2.

FEEDS on the fruit of *Pyrus*, (Apple.)

Carpocapsa saltitans. Westwood.

1876. Larva, pupa. *Riley.* Amer. Natural., vol. 10, p. 216.

1888. Larva, pupa, (figs.) *Lintner.* 4th Rept. N. York State Entom., p. 151.
FEEDS in seed-pods of *Euphorbiaceous* plant.

TINEIDÆ.

Anaphora agrotipennella. Grote.
1876. Larva, pupa. *Miss M. E. Murtfeldt.* Canad. Entom., vol. 8, p. 185.

Solenobia walshella. Clemens.
1861. Larva, (brief.) *Clemens,* (quotes Walsh in lit.) Proc. Entom. Soc. Philad., vol. 1, p. 132.
1872. Larva, cocoon. *Clemens.* Tineina of N. Amer. (Stainton), p. 182.
FOOD PLANT. *Lichens.*

Xylesthia pruniramiella. Clemens.
1859. Larva. *Clemens.* Proc. Acad. N. Sc., Philad., September.
1872. Larva. *Clemens.* Tineina of N. Amer. (Stainton), p. 54.
FEEDS on woody nodules of plum trees.

Tinea tapetzella. Linn.
1857. Larva, case. *Chenu—Demarets.* Encyc. Hist. Nat. Papillons, vol. 2, p. 289.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 290.
1859. Larva. *Humphreys.* Gener. Brit. Moths, p. 167.
1864. Larva, cocoon. *Jaeger.* Life N. Amer. Ins., p. 186.
1872. Larva, cocoon, (figs.) *L. Figuier.* Insect world, p. 280.
1877. Larva, cocoon, (fig.) *Packard.* Half-hours with Insects, p. 311.
FEEDS on woolen fabrics.

Tinea pellionella. Linn.
1841. Larva, pupa. *Harris.* Ins. Inj. Vegetat., 1st edit., p. 361.
1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 293.
1859. Egg, larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., September.
1867. Larva, case, pupa, (fig.) *Packard,* (as T. flavifrontella.) Amer. Naturalist, vol. 1, p. 423.
1872. Egg, larva. *Clemens.* Tineina of N. Amer. (Stainton), p. 51.
1873. Larva, case, pupa, (fig.) *J. Williams,* (as T. flavifrontella.) Rept. Entom. Soc. Ontario, p. 27.
1873. Larva, pupa. *A. J. Cook,* (as T. flavifrontalis.) 12th Rept. Michigan Board Agr., p. 151.
1885. Larva, case, pupa. *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 439.
FEEDS on woolen fabrics, feathers, etc.

Tinea biselliella. Hummel.
1859. Larva, (brief.) *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 293.

1885. Egg, larva, pupa, (figs.) *Fernald.* Kingsley's Stand. N. Hist., vol. 2, p. 439.

FEEDS on corn in granaries.

Tinea dorsitrigella. Clemens.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 262.

FEEDS on woolen fabrics, etc.

Eudarcia simulatricella. Clemens.

1873. Larva, case. *V. T. Chambers,* (as T. cunitariella.) Canad. Entom., vol. 5, p. 85.

Incurvaria acerifoliella. Fitch.

1856. Larva. *Fitch.* 2d Rept. Ins. N. York, p. 269.

1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 114.

1885. Larva. *J. Fletcher.* Rept. Entom. Dept. Agr. Ontario, p. 31.

FOOD PLANT. *Acer.*

Hyponomeuta evonymella. Chambers.

1872. Larva. *Chambers.* Canad. Entom., vol. 4, p. 42.

FOOD PLANT. *Euonymus atropurpureus.*

Prionuba yuccasella. Riley.

1873. Life history, (figs.) *Riley.* 5th Missouri Rept., p. 150.

1873. Larva, pupa, (figs.) *Packard,* (quotes Riley.) Amer. Naturalist, vol. 7, p. 477.

1874. Pupa, (fig.) *Riley.* 6th Missouri Rept., p. 131.

FOOD PLANT. *Yucca.*

Prodoxus decipiens. Riley.

1880. Larva, case, pupa. *Riley.* Amer. Entom., vol. 1, 2d ser., p. 143.

Plutella cruciferarum. Zeller.= **limbipennella.** Clem.

1856. Larva, case, pupa, (figs.) *Fitch,* (as C. brassicella.) 1st Rept. Ins. N. York, p. 172.

1871. Larva, case, (figs.) *T. Glover.* Rept. U. S. Dept. Agr., p. 82.

1872. Larva, pupa, (figs.) *T. Glover.* Trans. N. York Agr. Soc., p. 82.

1877. Larva, case, (fig.) *Packard.* Half-hours with Insects, p. 59.

1877. Larva, case, pupa. *Packard,* (as P. xylostella.) Inj. Ins. West, Hayden's Rept., p. 751.

1877. Larva. *French.* Trans. Dept. Agr. Ill., vol. 15, p. 267.

1879. Larva, pupa. *C. Thomas.* Trans. Dept. Agr. Ill., vol. 17, Append., p. 52.

1885. Larva, cocoon. *Fernald,* (as P. xylostella.) Kingsley's Stand. N. Hist., vol. 2, p. 440.

FOOD PLANT. *Cruciferæ.*

Depressaria heracliana. De Geer.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths, vol. 2, p. 329.

1869. Larva. *Bethune,* (as D. ontariella.) Canad. Entom., vol. 2, p. 1.

1880. Larva, cocoon, pupa. *A. J. Cook.* 19th Rept. Michigan Board Agr., p. 275.

1883. Larva. *Hy. Edwards.* Papilio, vol. 3, p. 24.

1888. Larva, pupa, (figs.) *Riley.* Ins. Life, vol. 1, p. 94.

FEEDS in stems of *Umbelliferæ.*

Depressaria hilarella. Zeller.

1883. Larva. *Coquillett.* Papilio, vol. 3, p. 98.

FOOD PLANT. *Sanicula.*

Depressaria grotella. Robinson.

1883. Larva. *Coquillett.* Papilio, vol. 3, p. 98.

FOOD PLANT. *Corylus americana.*

Depressaria atrodorrella. Clemens.

1883. Larva. *Coquillett.* Papilio, vol. 3, p. 98.

FOOD PLANT. *Bidens frondosa.*

Depressaria pulvipennella. Clemens.

1883. Larva. *Coquillett.* Papilio, vol. 3, p. 97.

FOOD PLANT. *Solidago.*

Depressaria robiniella. Packard.

1881. Larva, (brief.) *Packard.* Ins. Inj. Forest Trees, p. 98.

FOOD PLANT. *Robinia.*

Adrastela quercifoliella. Chambers.

1872. Larva. *Chambers.* Canad. Entom., vol. 4, p. 207.

FOOD PLANT. *Quercus.*

Cryptolechia quercicella. Clemens.

1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., June.

1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 150.

1872. Larva. *Chambers,* (as H. faginella). Canad. Entom., vol. 4, p. 132.

FOOD PLANT. *Quercus.*

Cryptolechia tentoriferella. Clemens.

1860. Larva, cocoon, pupa. *Clemens.* Proc. Acad. N. Sc. Philad., June.

1872. Larva, cocoon, pupa. *Clemens.* Tineina N. Amer. (Stainton), p. 150.

FOOD PLANTS. *Quercus, Cerasus, Carya.*

Gelechia robiniella. Fitch.

1858. Larva. *Fitch,* (as Anacampsis robinella.) 5th Rept. Ins. N. York, p. 834.

FOOD PLANT. *Robinia.*

Gelechia solaniella. Chambers.

1873. Larva. *Chambers.* Cand. Entom., vol. 5, p. 176.

1878. Larva, cocoon. *Chambers,* (quotes Miss Murtfeldt in lit.) Canad. Entom., vol. 10, p. 51.

FOOD PLANT. *Solanum carolinense.*

Gelechia querciella. Chambers.

1872. Larva. *Chambers,* (as Dep. quer.) Canad. Entom., vol. 4, p. 128.

FOOD PLANT. *Quercus.*

Gelechia juncidella. Clemens.

1871. Larva, case, pupa. *Miss Murtfeldt,* (as Dep. dubitella.) Canad. Entom., vol. 6, p. 221.

FOOD PLANT. *Ambrosia.*

Gelechia cercerisella. Chambers.

1872. Larva. *Chambers,* (as Depr. cerc.) Canad. Entom., vol. 4, p. 106.

FOOD PLANT. *Cercis canadensis.*

Gelechia platanella. Chambers.

1872. Larva. *Chambers.* Canad. Entom., vol. 4, p. 146.

FOOD PLANT. *Platanus occidentalis.*

1877. Larva, (fig.) *Packard.* Inj. Ins. West, Hayden's Rept., p. 714.
1885. Life history, (figs.) *Lintner.* 2d Rept. N. York State Entom., p. 103.
FEEDS on grain of wheat, barley, etc.

Gelechia agrimoniella. Clemens.
1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., May.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 112.
1883. Larva. *Coquillett.* Papilio, vol. 3, p. 98.
FOOD PLANT. *Agrimonia eupatoria.*

Gelechia rhoifructella. Clemens.
1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., May.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 114.
1883. Larva. *Coquillett.* Papilio, vol. 3, p. 99.
FOOD PLANTS. *Rhus, Populus.*

Gelechia fungivorella. Clemens.
1864. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 2, p.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 262.
FEEDS on galls of *Salix.*

Gelechia salicifungella. Clemens.
1864. Larva. Proc. Entom. Soc. Philad., vol. 2, p.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 262.
FEEDS on galls of *Salix.*

Gelechia scutellariella. Chambers.
1873. Larva. *Chambers.* Canad. Entom., vol. 5, p. 175.
FOOD PLANT. *Scutellaria.*

Gelechia rubenella. Chambers.
1874. Larva. *Miss Murtfeldt.* Canad. Entom., vol. 6, p. 221.
FOOD PLANT. *Quercus.*

Gelechia ambrosiella. Chambers.
1875. Larva. *Chambers.* Cincinnati Quart. Jour. Sc., p. 240.
FOOD PLANT. *Ambrosia.*

Gelechia pseudacaciella. Chambers.
1872. Larva. *Chambers.* Canad. Entom., vol. 4, p. 107.
1879. Larva. *J. H. Comstock.* Rept. U. S. Dept. Agr., p. 253.
1880. Larva. *Chambers.* Psyche, vol. 3, p. 65.
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 99.
FOOD PLANT. *Robinia pseudacacia.*

Gelechia pinifoliella. Chambers.
1879. Egg, larva, pupa, (figs.) *Comstock.* Rept. U. S. Dept. Agr., p. 240.
1881. Larva, pupa, (figs.) *Packard,* (quotes Comstock.) Ins. Inj. Forest Trees, p. 208.
1883. Larva, (fig.) *Saunders.* Rept. Entom. Soc. Ontario, p. 59.
FOOD PLANT. *Pinus rigida.*

Gelechia robinifoliella. Chambers.
1879. Larva, pupa. *Comstock.* Rept. U. S. Dept. Agr., p. 225.
1881. Larva. *Packard.* Ins. Inj. Forest Trees, p. 99.
FOOD PLANT. *Robinia.*

Gelechia physaliella. Chambers.
1872. Larva. *Chambers.* Canad. Entom., vol. 4, p. 173.
FOOD PLANT. *Physalis viscosa.*

Gelechia quinqueannulella. Chambers.
1872. Larva. *Chambers.* Canad. Entom., vol. 4, p. 192.
FOOD PLANT. *Quercus tinctoria*

Gelechia quercinigræella. Chambers.
1872. Larva. *Chambers.* Canad. Entom., vol. 4, p. 171.
FOOD PLANT. *Quercus nigra.*

Gelechia quercivorella. Chambers.
1872. Larva. *Chambers.* Canad. Entom., vol. 4, p. 173.
FOOD PLANT. *Quercus.*

Gelechia discococella. Chambers.
1883. Larva. *Coquillett.* Papilio, vol. 3, p. 98.
FOOD PLANT. *Polygonum.*

Gelechia obliquistrigella. Chambers.
1885. Larva, pupa. *Packard.* Bulletin No. 12, U. S. Dept. Agr., p. 21.
FOOD PLANT. Buds of *Abies.*

Gelechia trististrigella. Walsingham.
1883. Larva. *Coquillett.* Papilio, vol. 3, p. 99.
FOOD PLANT. *Corylus.*

Gelechia prunifoliella. Chambers.
1873. Larva. *Chambers,* (as Evippe prunif.) Canad. Entom., vol. 5, p. 186.
FOOD PLANT. *Prunus.*

Gelechia gallæsolidaginis. Riley.
1869. Life history, (figs.) *Riley.* 1st Missouri Rept., p. 173.
FEEDS in galls of *Solidago.*

Gelechia abietisella. Packard.
1884. Larva. *Packard.* Amer. Naturalist, vol. 18, p. 296.

Gelechia gallæasterella. Kellicott.
1878. Larva, pupa. *Kellicott.* Canad. Entom., vol. 10, p. 203.

Gelechia flavocortella. Clemens.
1880. Larva. *Coquillett.* Trans. Dept. Agr. Ill., vol. 18, Append., p. 153.
FOOD PLANT. *Helianthus.*

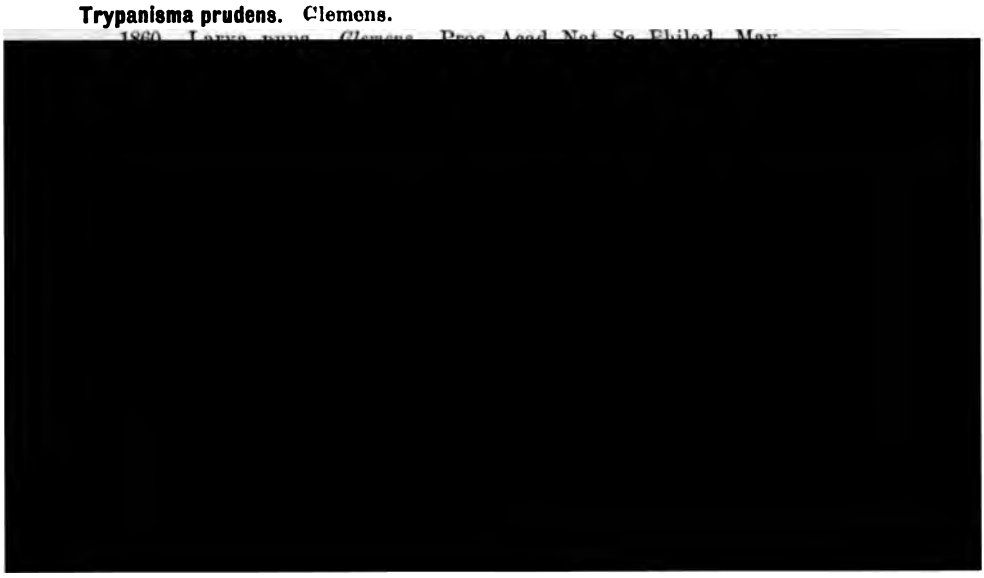
Gelechia beneficentella. Murtfeldt.
1881. Larva, pupa. *Mary E. Murtfeldt.* Canad. Entom., vol. 13, p. 245.
FOOD PLANT. *Solanum carolinense.*

Gelechia cinerella. Murtfeldt.
1881. Larva, cocoon. *Mary E. Murtfeldt.* Canad. Entom., vol. 13, p. 244.
FOOD PLANT. *Solanum carolinense.*

Gelechia formosella. Murtfeldt.
1881. Larva, cocoon. *Mary E. Murtfeldt.* Canad. Entom., vol. 13, p. 244.
FOOD PLANT. Laurel oak, (*Quercus.*)

Gelechia chambersella. Murtfeldt.
1881. Larva, cocoon. *Mary E. Murtfeldt.* Canad. Entom., vol. 13, p. 243.
FOOD PLANT. *Ambrosia.*

Trypanisma prudens. Clemens.
1860. Larva, pupa. *Clemens.* Proc. Acad. Nat. Sc. Philad., May.



Ypsolophus caryæfoliella. Chambers.
1872. Larva. *Chambers.* Canad. Entom., vol. 4, p. 224.
FOOD PLANT. *Carya alba.*

Ypsolophus pometellus. Harris, (and vars.)
1853. Larva, pupa. *Harris.* Jour. N. York State Agr. Soc., p. 103.
1854. Larva. *Emmons.* Nat. Hist. N. York, vol. 5, p. 254.
1856. Larva. *Fitch.* 2d Rept. Ins. N. York, p. 231.
1857. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 345.
1872. Larva. *Chambers,* (as Y. quercipomonella.) Canad. Entom., vol. 4, p. 223.
1877. Larva. *Packard.* Half-hours with Insects, p. 183.
1882. Larva, (brief.) *Walsingham.* Trans. Amer. Entom. Soc., vol. 10, p. 187.
FOOD PLANT. *Pyrus.* (Oák-galls. Fitch.)

Nothris setosella. Clemens.
1872. Larva. *Chambers,* (as Yps. eupatoriella.) Canad. Entom., vol. 4, p. 221.
FOOD PLANT. *Eupatorium.*

Nothris trinotella. Coquillett.
1883. Larva. *Coquillett.* Papilio, vol. 3, p. 10.
FOOD PLANT. *Corylus.*

Nothris citrifoliella. Chambers.
1879. Larva. *J. H. Comstock.* Rept. U. S. Dept. Agr., p. 205.
1883. Larva, pupa. *Saunders.* Ins. Inj. Fruits, p. 382.
1885. Larva. *Hubbard,* (quotes Comstock.) Ins. Inj. Orange, p. 154.
FOOD PLANT. *Citrus.*

Blastobasis glandulella. Riley.
1872. Larva. *Riley.* Canad. Entom., vol. 4, p. 19.
1872. Larva, pupa, (figs.) *Riley.* 4th Missouri Rept., p. 144.
1881. Larva, (fig.) *Packard,* (quotes Riley.) Ins. Inj. Forest Trees, p. 53.
FEEDS in acorns.

Blastobasis citricolella. Chambers.
1879. Larva. *J. H. Comstock.* Rept. Dept. Agr., p. 206.
FEEDS in fruit of Orange.

Blastobasis coccivorella. Chambers.
1879. Larva. *J. H. Comstock.* Rept. U. S. Dept. Agr., p. 244.
FEEDS on insects of the family *Coccidæ.*

Lithariapteryx abronicella. Chambers.
1876. Larva. *Chambers.* Canad. Entom., vol. 8, p. 219.
FOOD PLANT. *Ambrosia fragrans.*

Butalis fuscicomella. Clemens.
1860. Egg. *Clemens.* Proc. Acad. Nat. Sc. Philad., May.
1872. Egg. *Clemens.* Tineina N. Amer. (Stainton), p. 126.

Butalis matutella (?). Clemens.
1874. Larva. *Chambers.* Canad. Entom., vol. 6, p. 9.
FOOD PLANTS. *Ambrosia, etc.*

Antispila viticordifoliella. Clemens.
1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., June.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 142.
1879. Case, (brief.) *Chambers.* Canad. Entom., vol. 11, p. 126.
1880. Larva. *Chambers.* Psyche, vol. 3, pp. 63, 149.
FOOD PLANT. *Vitis.*

Antispila isabella. Clemens.
1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Phila., June.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 142.
1879. Case, (brief.) *Chambers.* Canad. Entom, vol 11, p. 126.
FOOD PLANT. *Vitis.*

Antispila nyssæfoliella. Clemens.
1860. Larva, cocoon. *Clemens.* Proc. Acad. Nat. Sc. Philad., January.

1872. Larva, cocoon. *Clemens.* Tineina N. Amer. (Stainton), pp. 20, 102.
1880. Larva. *Chambers.* Psyche, vol. 3, p. 63.
FOOD PLANT. *Nyssa multiflora.*

Antispila cornifoliella. Clemens.
1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., January.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 103.
1879. Case, (brief.) *Chambers.* Canad. Entom., vol. 11, p. 126.
1880. Larva. *Chambers.* Psyche, vol. 3, p. 149.
FOOD PLANT. *Cornus florida.*

Antispila ampelopsifoliella. Chambers.
1874. Larva. *Chambers.* Canad. Entom., vol. 6, p. 169.
1879. Case, (brief.) *Chambers.* Canad. Entom., vol. 11, p. 126.
1880. Larva. *Chambers.* Psyche, vol. 3, p. 149.
FOOD PLANT. *Ampelopsis.*

Antispila hydrangæella. Chambers.
1874. Larva. *Chambers.* Canad. Entom., vol. 6, p. 170.
1879. Case, (brief.) *Chambers.* Canad. Entom., vol. 11, p. 126.
FOOD PLANT. *Hydrangea nivea.*

Aspidisca juglandiella. Chambers.
1874. Larva. *Chambers.* Canad. Entom., vol. 6, p. 151.
FOOD PLANT. *Juglans.*

Aspidisca lucifluella. Clemens.
1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., June.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 143.
1879. Case, (fig.) *W. S. Barnard.* Proc. Ass. Adv. Sc., vol. 28, p. 476.
1880. Larva. *Chambers.* Psyche, vol. 3, p. 64.
FOOD PLANT. *Carya.*

Aspidisca saliciella. Chambers.
1861. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 171.
1880. Egg, larva. *Chambers.* Psyche, vol. 3, p. 147.
FOOD PLANT. *Salix.*

Aspidisca splendoriferella. Clemens.
1860. *Clemens.* Proc. Acad. Nat. Sc., Philad., January.
1861. Larva. *Clemens,* (as A. pruinella.) Proc. Acad. Nat. Sc. Philad., November.
1869. Larva, (brief.) *Packard,* (as L. saccatella.) Guide to Study of Ins., p. 355.

Gracilaria superbifrontella. Clemens.

1860. Larva. *Clemens.* Proc. Acad. Nat. Sc., Philad., January.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 91.
FOOD PLANT. *Hamamelis.*

Gracilaria erigeronella. Chambers.

1872. Larva. *Chambers,* (as G. plantaginisella.) Canad. Entom., vol. 4, p. 11.
FOOD PLANTS. *Plantago, Erigeron.*

Gracilaria juglandisnigræella. Chambers.

1872. Larva. *Chambers.* Canad. Entom., vol. 4, p. 29.
FOOD PLANT. *Juglans.*

Gracilaria negundella. Chambers.

1880. Larva. *Chambers.* Psyche, vol. 3, p. 66.
FOOD PLANT. *Negundo.*

Gracilaria blandella. Clemens.

1873. Larva. *Chambers.* Canad. Entom., vol. 5, p. 13.
FOOD PLANT. *Juglans.*

Gracilaria veustella. Clemens.

1873. Larva. *Chambers,* (as G. eupatoriella.) Canad. Entom., vol. 5, p. 46.
FOOD PLANT. *Eupatorium.*

Gracilaria lespedezæfoliella. Clemens.

1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., June.
1863. Larva. *Clemens,* (as G. robiniella.) Proc. Entom. Soc. Philad., vol. 2, p. 4.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), pp. 145, 207.
1880. Larva, (brief.) *Chambers.* Amer. Entom., vol. 1, 2d ser., p. 61.
1881. Larva, (brief.) *Packard.* Ins. Inj. Forest Trees, p. 98.
FOOD PLANTS. *Lespedeza, Robinia.*

Ornix cratægifoliella. Clemens.

1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., January.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 94.
1873. Larva. *Chambers.* Canad. Entom., vol. 5, p. 49.
FOOD PLANT. *Crataegus tomentosa.*

Ornix geminatella. Packard.

1869. Larva, case, pupa, (figs.) *Packard,* (as Lithoc. gem.) Guide to Study of Ins., p. 353, pl. 8.
1877. Larva. *Packard.* Half-hours with Insects, p. 186.
1883. Larva, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 150.
FOOD PLANT. *Pyrus.*

Ornix quadripunctella. Clemens.

1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 86.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 177.
FOOD PLANT. *Amelanchier canadensis.*

Ornix prunivorella. Chambers.

1873. Larva. *Chambers.* Canad. Entom., vol. 5, p. 50.
FOOD PLANT. *Prunus.*

Ornix inusitatumella. Chambers.

1873. Larva. *Chambers.* Canad. Entom., vol. 5, p. 48.
FOOD PLANT. *Crataegus.*

Coleophora malivorella. Riley.

1878. Larva, (fig.) *Riley.* Rept. U. S. Dept. Agr., p. 48.
1879. Larva, pupa, (fig.) *Lintner.* Rept. N. York State Agr. Soc., p. 52.
1880. Larva. *Coquillett,* (quotes Riley.) Trans. Dept. Agr. Ill., vol. 18, Append., p. 156.
1883. Egg, larva, case, pupa, (figs.) *Saunders.* Ins. Inj. Fruits, p. 115.
FOOD PLANT. *Pyrus malus.*

Coleophora vernoniella. Chambers.

1878. Larva, case. *Chambers.* Canad. Entom., vol. 10, p. 114.
FOOD PLANT. *Vernonia.*

Coleophora quercicella. Clemens.

1861. Larva, case. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 80.
1872. Larva, case. *Clemens.* Tineina N. Amer. (Stainton), p. 168.
FOOD PLANT. *Quercus.*

Coleophora rosacella. Clemens.

1861. Larva, case. *Clemens.* Proc. Entom. Soc. Philad., vol. 2, p. 426.
1872. Larva, case. *Clemens.* Tineina N. Amer. (Stainton), p. 251.
FOOD PLANT. *Rosa.*

Coleophora rosæfoliella. Clemens.

1864. Larva, case. *Clemens.* Proc. Entom. Soc. Philad., vol. 2, p. 426.
1872. Larva, case. *Clemens.* Tineina N. Amer. (Stainton), p. 251.
FOOD PLANT. *Rosa.*

Coleophora caryæfoliella. Clemens.

1861. Larva, case. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 78.
1872. Larva, case. *Clemens.* Tineina N. Amer., p. 166.
1878. Larva, case. *Chambers.* Canad. Entom. vol. 10, p. 113.
FOOD PLANT. *Carya.*

Coleophora ostryæ. Clemens.

1861. Larva, case. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 79.
1872. Larva, case. *Clemens.* Tineina N. Amer. (Stainton), p. 167.
FOOD PLANT. *Ostrya virginica.*

Coleophora corylifoliella. Clemens.

1861. Larva, case. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 79.
1872. Larva, case. *Clemens.* Tineina N. Amer. (Stainton), p. 166.
FOOD PLANT. *Corylus.*

Coleophora tiliæfoliella. Clemens.

1861. Larva, case. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 80.
1872. Larva, case. *Clemens.* Tineina N. Amer. (Stainton), p. 168.
FOOD PLANT. *Tilia.*

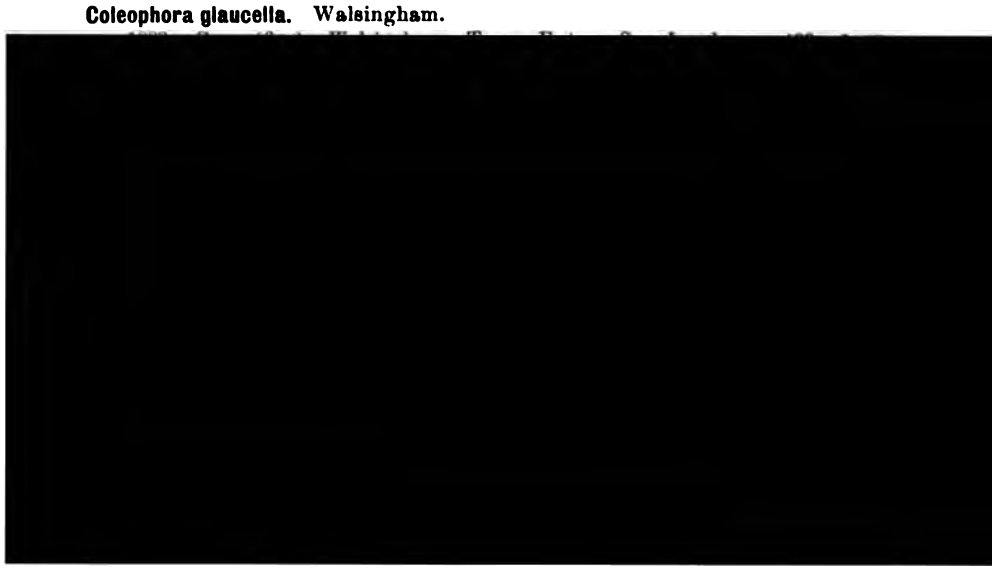
Coleophora viburniella. Clemens.

1861. Larva, case. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 79.
1872. Larva, case. *Clemens.* Tineina N. Amer. (Stainton), p. 167.
FOOD PLANT. *Viburnum.*

Coleophora pruniella. Clemens.

1861. Larva, case. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 79.
1872. Larva, case. *Clemens.* Tineina N. Amer. (Stainton), p. 167.
FOOD PLANT. *Prunus.*

Coleophora glaucella. Walsingham.



Coleophora rufolutrella. Chambers.

1882. Case, (fig.) *Walsingham.* Trans. Entom. Soc. London, p. 431, pl. 17.

FOOD PLANT. *Prunus americana.*

Coleophora cornella. Walsingham.

1882. Case, (fig.) *Walsingham.* Trans. Entom. Soc. London, p. 432, pl. 17.

FOOD PLANT. *Cornus pubescens.*

Coleophora viscidiflorella. Walsingham.

1882. Case, (fig.) *Walsingham.* Trans. Entom. Soc. London, p. 439, pl. 17.

FOOD PLANT. *Lynosyris viscidiflora.*

Coleophora octagonella. Walsingham.

1882. Case, (fig.) *Walsingham.* Trans. Entom. Soc. London, p. 431, pl. 17.

FOOD PLANT. *Persea carolinensis.*

Coleotechnites citriella. Chambers.

1879. Larva, case. *Comstock.* Rept. U. S. Dept. Agr., p. 206.

FOOD PLANT. *Citrus,* (Orange.)

Bedellia somnulentella. Zeller.

1859. Larva. *H. T. Stainton.* Brit. Butt. and Moths., vol. 2, p. 395.

1862. Life history. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 147.

1872. Life history. *Clemens.* Tineina N. Amer. (Stainton), p. 189.

FOOD PLANTS. *Convolvulus, Ipomea.*

Batrachedra salicipomella. Clemens.

1865. Life history. *Clemens,* (quotes Walsh in lit.) Proc. Entom. Soc. Philad., vol. 5, p. 143.

1872. Life history. *Clemens,* (quotes Walsh in lit.) Tineina N. Amer. (Stainton), p. 267.

FEEDS in galls of *Salix.*

Laverna gleditschiella. Chambers.

1876. Larva. *Chambers.* Canad. Entom., vol. 8, p. 137.

1880. Egg. *Chambers.* Psyche, vol. 3, p. 66.

FOOD PLANT. *Gleditschia.*

Laverna sabalella. Chambers.

1879. Larva, case, pupa, (fig.) *Comstock.* Rept. U. S. Dept. Agr., p. 209, pl. 2.

FOOD PLANT. *Palmetto.*

Laverna murtfeldtiella. Chambers.

1879. Larva, cocoon. *Chambers,* (quotes Miss Murtfeldt in lit.) Canad. Entom., vol. 11, p. 6.

FOOD PLANT. *Œnothera.*

Laverna cephalanthiella. Chambers.

1879. Larva, mine. *Chambers.* Canad. Entom., vol. 11, p. 7.

FOOD PLANT. *Cephalanthus.*

Laverna circumscriptella. Zeller.

1878. Larva. *Chambers,* (quotes Miss Murtfeldt in lit.) Canad. Entom., vol. 10, p. 239.

FOOD PLANT. *Œnothera.*

Walshia amorphella. Clemens.

1864. Larva, (brief.) *Clemens,* (quotes Walsh in lit.) Proc. Entom. Soc. Philad., vol. 2, p. 416.

1870. Larva, gall, (fig.) *Riley.* 2d Missouri Rept., p. 132.

1872. Larva, (brief.) *Clemens,* (quotes Walsh in lit.) Tineina N. Amer. (Stainton), p. 241.

FOOD PLANT. *Amorpha fruticosa,* (forming galls.)

Chrysocorys* erythriella. Clemens.

1860. Larva, cocoon, pupa. *Clemens.* Proc. Acad. Nat. Sc. Philad., May.

1872. Larva, cocoon, pupa. *Clemens.* Tineina N. Amer. (Stainton), p. 132.

FEEDS on racemes of *Rhus.*

*See also page 136.

Elachista brachyelytrifoliella. Clemens.

1864. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 2, p. 425.

1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 249.

FOOD PLANT. *Brachelytrum aristatum.*

Cycloplasis panicifoliella. Clemens.

1864. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 2, p. 422.

1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 248.

FOOD PLANT. *Panicum clandestinum.*

Aeaea ostryæella. Chambers.

1874. Larva. *Chambers.* Canad. Entom., vol. 6, p. 74.

FOOD PLANT. *Ostrya virginica.*

Aeaea purpuriella. Chambers.

1880. Larva. *Chambers.* Psyche, vol. 3, p. 64.

FOOD PLANT. *Robinia pseudacacia.*

Tischeria solidaginifoliella. Clemens.

1859. Pupa, cocoon. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.

1872. Pupa, cocoon. *Clemens.* Tineina N. Amer. (Stainton), p. 81.

FOOD PLANT. *Solidago.*

Tischeria zelleriella. Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.

1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 81.

FOOD PLANT. *Quercus.*

Tischeria citrinipenella. Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc., Philad., November.

1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 82.

FOOD PLANT. *Quercus.*

Tischeria fuscomarginella. Chambers.

1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 110.

FOOD PLANT. *Quercus alba.*

Tischeria tinctoriella. Chambers.

1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 108.

FOOD PLANT. *Castanea Americana.*

Tischeria badiiella. Chambers.

1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 109.

FOOD PLANT. *Quercus alba.*

Tischeria quercivorella. Chambers.

1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 110.

FOOD PLANTS. *Quercus, nigra, etc.*

Tischeria castaneæella. Chambers.

Lithocolletis robiniella. Clemens.

1859. Larva, pupa. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.
1871. Larva. *Chambers.* Canad. Entom., vol. 3, pp. 54, 86.
1872. Larva, pupa. *Clemens.* Tineina N. Amer. (Stainton), pp. 12, 66.
1880. Larva, (brief.) *Chambers.* Amer. Entom., vol. 1, 2d series, p. 61.
1881. Larva. *Packard,* (quotes Clemens.) Ins. Inj. Forest Trees, p. 99.
FOOD PLANT. *Robinia.*

Lithocolletis ulmella. Chambers.

1871. Larva. *Chambers.* Canad. Entom., vol. 3, p. 149.
FOOD PLANT. *Ulmus americana.*

Lithocolletis helianthivorella. Chambers.

1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 100.
FOOD PLANT. *Helianthus.*

Lithocolletis mariæella. Chambers.= **trifasciella.** Haworth. (?)

1875. Larva, pupa, cocoon. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 99.
FOOD PLANT. *Symphoricarpus vulgaris.*

Lithocolletis quercitella. Chambers.

1875. Larva, (brief.) *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 102.
FOOD PLANT. *Quercus nigra.*

Lithocolletis albanotella. Chambers.

1875. Larva, (brief.) *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 101.
FOOD PLANT. *Quercus nigra.*

Lithocolletis acerifella. Clemens.

1859. Larva, cocoon. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.
1872. Larva, cocoon. *Clemens.* Tineina N. Amer. (Stainton), p. 75.
FOOD PLANTS. *Acer, Hamamelis.*

Lithocolletis guttifinitella. Clemens.

1859. Larva, cocoon. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.
1872. Larva, cocoon. *Clemens.* Tineina N. Amer. (Stainton), p. 76.
FOOD PLANT. *Rhus toxicodendron.*

Lithocolletis pomifoliella. Zeller.= **cratægella.** Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.
1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., June.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), pp. 77, 141.
FOOD PLANTS. *Pyrus, Crataegus.*

Lithocolletis fitchella. Clemens.= **quercifoliella.** Fitch.

1859. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 827.
1879. Larva, pupa. *Comstock.* Rept. U. S. Dept. Agr., p. 231.
1879. Mine. *Chambers.* Canad. Entom., vol. 11, p. 90.
1881. Larva. *Packard,* (quotes Comstock.) Ins. Inj. Forest Trees, p. 52.
FOOD PLANT. *Quercus.*

Lithocolletis hamadryadella. Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 77.
1879. Larva, cocoon, pupa, (figs.) *Comstock.* Rept. U. S. Dept. Agr., p. 226.
1881. Larva. *Packard,* (quotes Comstock.) Ins. Inj. Forest Trees, p. 51.
FOOD PLANT. *Quercus.*

Lithocolletis obscuricostella. Clemens.

1859. Pupa, (brief.) *Clemens.* Proc. Acad. Nat. Sc., Philad., November.
1872. Pupa, (brief.) *Clemens.* Tineina N. Amer. (Stainton), p. 71.
FOOD PLANT. *Ostrya virginica.*

Lithocolletis ostryæfoliella. Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc., Philad., November.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 72.
1879. Mine, (brief.) *Chambers.* Canad. Entom., vol. 11, p. 91.
FOOD PLANT. *Ostrya virginica.*

Lithocolletis lucetiella. Clemens.

1859. Larva, cocoon. *Clemens.* Proc. Acad. Nat. Sc., Philad., November.
1872. Larva, cocoon. *Clemens.* Tineina N. Amer. (Stainton), p. 73.
FOOD PLANT. *Tilia americana.*

Lithocolletis obstrictella. Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc., Philad., November.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 73.
FOOD PLANT. *Quercus.*

Lithocolletis caryæfoliella. Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc., Philad., November.
1861. Larva. *Clemens,* (as L. juglandiella.) Proc. Entom. Soc. Philad., vol. 1, p. 81.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), pp. 74, 170.
FOOD PLANT. *Carya.*

Lithocolletis tubiferella. Clemens.

1860. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., June.
1872. *Clemens.* Tineina N. Amer. (Stainton), p. 140.
FOOD PLANT. *Quercus.*

Lithocolletis salicifoliella. Clemens.

1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 81.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 169.
FOOD PLANT. *Salix.*

Lithocolletis ornatella. Chambers.

1880. Larva, (brief.) *Chambers.* Amer. Entom., vol. 1, 2d series, p. 60.
FOOD PLANT. *Robinia.*

Lithocolletis ambrosiæella. Chambers.

1871. Larva. *Chambers.* Canad. Entom., vol. 3, p. 127.
1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 101.
FOOD PLANT. *Ambrosia.*

Lithocolletis desmodiella. Clemens.

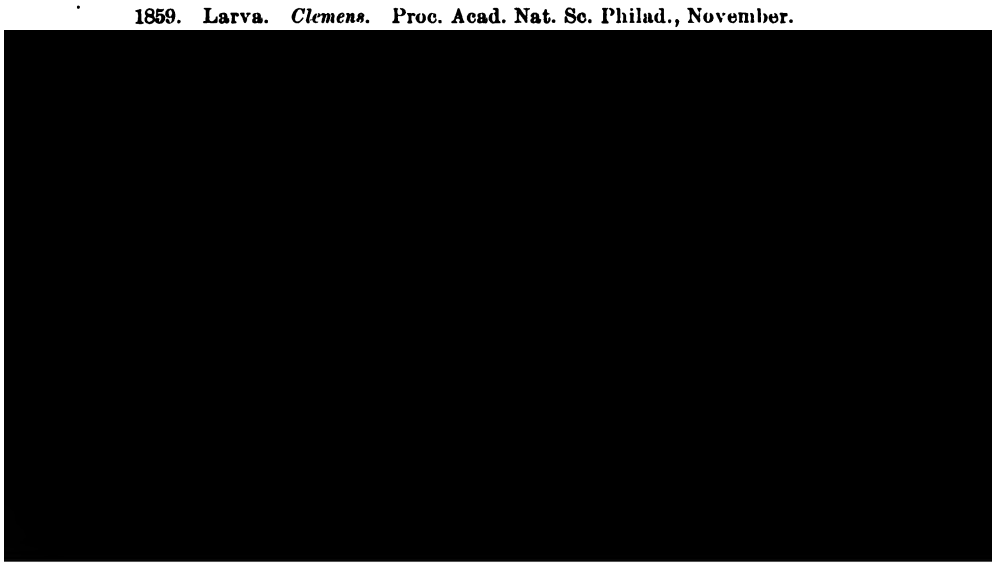
1859. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 68.
FOOD PLANT. *Desmodium.*

Lithocolletis lucidicostella. Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 66.
FOOD PLANT. *Acer saccharinum.*

Lithocolletis cerifereila. Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.



Lithocolletis castaneæella. Chambers.

1875. Larva, (brief.) *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 104.

FOOD PLANT. *Castanea americana.*

Lithocolletis clemensella. Chambers.

1879. Mine, (brief.) *Chambers.* Canad. Entom., vol. 11, p. 91.

FOOD PLANT. *Acer.*

Lithocolletis cerealella.

1885. Egg, larva. *Fernald.* Kingsley's Stand. Nat. Hist., vol. 2, p. 440.

Lithocolletis gregariella. Murtfeldt.

1881. Larva, cocoon, pupa. *Mary E. Murtfeldt.* Canad. Entom., vol. 13, p. 246.

FOOD PLANT. *Phaseolus pauciflorus.*

Lithocolletis cincinnatiella. Chambers.

1871. Larva. *Chambers.* Canad. Entom., vol. 3, p. 147.

1877. Larva, (fig.) *Chambers.* Psyche, vol. 2, p. 83.

FOOD PLANT. *Quercus.*

Lithocolletis celtifoliella. *Chambers.*

1871. Larva. *Chambers.* Canad. Entom., vol. 3, p. 129.

FOOD PLANT. *Celtis.*

NOTE.—The five species next following were described by Dr. Fitch under the generic name of Argyromiges.

Lithocolletis querci-albella. Fitch.

1858. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 828.

FOOD PLANT. *Quercus alba.*

Lithocolletis pseudacaciella. Fitch.

1858. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 836.

FOOD PLANT. *Robinia.*

Lithocolletis uhlerella. Fitch.

1858. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 836.

FOOD PLANT. *Robinia.*

Lithocolletis ostensackenella. Fitch.

1858. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 838.

FOOD PLANT. *Robinia.*

Lithocolletis morrisella. Fitch.

1858. Larva. *Fitch.* 5th Rept. Ins. N. York, p. 838.

FOOD PLANT. *Robinia.*

Marmara salicitella. Clemens.

1863. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 2, p. 7.

1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 212.

FOOD PLANT. *Salix.*

Leucanthiza amphicarpeæfoliella. Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.

1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 85.

FOOD PLANT. *Amphicarpæa monoica.*

Phyllocnistis populiella. Chambers.

1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 106.

FOOD PLANT. *Populus.*

Phyllocnistis smilacicella. Chambers.

1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 107.

FOOD PLANT. *Smilax glabra.*

Phyllocnistis liquidambarisella. Chambers.

1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 106.

FOOD PLANT. *Liquidambar.*

Phyllocnistis ampelopsiella. Chambers.

1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 107.

FOOD PLANT. *Ampelopsis.*

Phyllocnistis liriodendronella. Clemens.

1863. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 2, p. 13.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 220.
FOOD PLANT. *Liriodendron tulipifera.*

Phyllocnistis vitigenella. Clemens.

1859. Larva. *Clemens.* Proc. Acad. Nat. Sc. Philad., November.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), pp. 25, 84.
FOOD PLANT. *Vitis cordifolia.*

Cemiostoma albella. Chambers.

1871. Larva, cocoon. *Chambers.* Canad. Entom., vol. 3, p. 24.
FOOD PLANT. *Populus.*

Bucculatrix pomifoliella. Clemens.

1860. Larva, cocoon. *Clemens.* Proc. Acad. Nat. Sc. Philad., June.
1872. Larva, cocoon. *Clemens.* Tineina N. Amer. (Stainton), p. 146.
1872. Larva, pupa, cocoon, (fig.) *Riley.* 4th Missouri Rept., p. 49.
1876. Larva. *G. H. Perkins,* (quotes Riley). 2d Rept. Vermont Board Agr., p. 597.
1880. Cocoon, (fig.) *Riley.* Amer. Entom., vol. 1, 2d series, p. 23.
1880. Larva, pupa. *Riley.* Amer. Entom., vol. 1, 2d series, p. 23.
1881. Larva. *Packard,* (quotes Clemens.) Ins. Inj. Forest Trees, p. 256.
1883. Larva, cocoon, (figs.) *Saunders.* Ins. Inj. Fruits, p. 118.
FOOD PLANTS. *Pyrus malus, Ambrosia.*

Bucculatrix thuiella. Packard.

1871. Larva, cocoon. *Packard.* Rept. Board Agr. Mass., p. 373.
1877. Larva, cocoon, (fig.) *Packard.* Half-hours with Insects, p. 187.
1881. Larva, cocoon, (fig.) *Packard.* Ins. Inj. Forest Trees, p. 256.
FOOD PLANT. *Thuja occidentalis.*

Bucculatrix trifasciella. Clemens.

1865. Cocoon. *Clemens.* Proc. Entom. Soc. Philad., vol. 5, p. 147.
1872. Cocoon. *Clemens.* Tineina N. Amer. (Stainton), p. 272.

Bucculatrix ambrosiæfoliella. Chambers.

1882. Larva. *Chambers.* Canad. Entom., vol. 14, p. 153.
FOOD PLANT. *Ambrosia.*

Nepticula saginella. Clemens.

1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 85.
1865. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 5, p. 146.
1872. Larva, cocoon. *Clemens.* Tineina N. Amer. (Stainton), pp. 175, 271.
FOOD PLANT. *Quercus.*

1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 172.
FOOD PLANT. *Ostrya virginica.*

Nepticula virginiella. Clemens.
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 83.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 172.
FOOD PLANT. *Ostrya virginica.*

Nepticula cratægifoliella. Clemens.
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 83.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 173.
FOOD PLANT. *Cratægus.*

Nepticula juglandifoliella. Clemens.
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 84.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 173.
FOOD PLANT. *Juglans.*

Nepticula caryæfoliella. Clemens.
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 84.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 174.
FOOD PLANT. *Carya.*

Nepticula villosella. Clemens.
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 84.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 174.
FOOD PLANT. *Rubus villosus.*

Nepticula amelanchierella. Clemens.
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 84.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 174.
FOOD PLANT. *Amelanchier canadensis.*

Nepticula (?) prunifoliella. Clemens.
1861. Mine. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 84.
1872. Mine. *Clemens.* Tineina N. Amer. (Stainton), p. 174.
FOOD PLANT. *Prunus.* Dr. Clemens thinks this mine may be the work of a dipterous insect.

Nepticula anguinella. Clemens.
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 85.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 175.
FOOD PLANT. *Quercus.*

Nepticula platea. Clemens.
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 85.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 175.
FOOD PLANT. *Quercus.*

Nepticula rosæfoliella. Clemens.
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 85.
1872. Larva. *Clemens.* Tineina N. Amer. (Stainton), p. 176.
FOOD PLANT. *Rosa.*

Nepticula serotinæella. Chambers.
1873. Larva. *Chambers.* Canad. Entom., vol. 5, p. 126.
FOOD PLANT. *Prunus serotina.*

Nepticula nyssæfoliella. Clemens.
1880. Larva. *Chambers.* Psyche, vol. 3, p. 66.

Nepticula castaneæfoliella. Chambers.
1875. Mine. *Chambers.* Cincinnati Quart. Jour. Sc., vol. 2, p. 117.
FOOD PLANT. *Castanea americana.*

Nepticula pteliacella. Chambers.
1880. Larva. *Chambers.* Psyche, vol. 3, p. 137.
FOOD PLANT. *Ptelia trifoliata.*

Micropteryx pomivorella. Packard.
1870. Larva. *Packard.* Inj. Ins., new or little known, p. 6.

1877. Larva, cocoon. *Packard.* Half-hours with Insects, p. 188.
FOOD PLANT. *Pyrus malus*, (Apple.)

NOTE.—There is considerable doubt as to the position of the two following genera, but as they are placed by many authors among the Tineidæ, I give the references to them.

Choreutes silphiella. Grote.
1881. Larva. *Grote*, (quotes Coquillett in lit.) Papilio, vol. 1, p. 40.
FOOD PLANT. *Silphium integrifolium.*

Brenthia pavonacella. Clemens.
1878. Larva, cocoon. *Chambers.* Canad. Entom., vol. 10, p. 76.
FOOD PLANT. *Amphicarpæa monoica.*

The three species of Tineidæ following were described by Dr. Clemens from the larva. The imagines are unknown.

Catastega timidella. Clemens.
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 177.

Catastega hamameliella. *Clemens.*
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad. vol. 1, p. 178.

Catastega aceriella. *Clemens.*
1861. Larva. *Clemens.* Proc. Entom. Soc. Philad., vol. 1, p. 178.

PTEROPHORIDÆ.

Chrysocorys* felicella. Walsingham.
1880. Larva, cocoon, pupa, (figs.) *Walsingham.* Pterop. Cal. Oregon, p. 3, pl. 1.
FOOD PLANT. *Orthocarpus.*

Platyptilus cardui. Zeller.
1869. Larva, pupa, (fig.) *Riley*, (as P. carduidactylus.) 1st Missouri Rept., p. 180.
1880. Larva, (brief.) *Walsingham.* Pterop. Cal. Oregon, p. 8.
1881. Larva, pupa, (brief.) *Kellicott.* Bull. Buffalo Soc. N. Hist., vol. 4, p. 47.
FOOD PLANT. *Cirsium lanceolatum.*

Platyptilus orthocarpi. Walsingham.
1880. Larva, (brief.) *Walsingham.* Pterop. Cal. Oregon, p. 12.
FOOD PLANT. *Orthocarpus.*

Oxyptilus periscelidactylus. Fitch, (Pterophorus of authors.)
1854. Larva, pupa. *Fitch.* 1st Rept. Ins. N. York, p. 140.
1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 402.
1868. Larva. *Packard.* Amer. Naturalist, vol. 2, pp. 220, 333.
1869. Larva, pupa, (figs.) *Riley.* 1st Missouri Rept., p. 137.

Oedematophorus occidentalis. Walsingham.
1880. Larva, (brief.) *Walsingham.* Pterop. Cal. Oregon, p. 39.
FOOD PLANT. A species of Sunflower, (*Helianthus.*)

Oedematophorus inquinatus. Zeller.
1882. Larva. *Coquillett.* Papilio, vol. 2, p. 61.
FOOD PLANT. *Ambrosia.*

Oedematophorus ambrosiæ. Murtfeldt.
1880. Larva, pupa. *Mary E. Murtfeldt.* Amer. Entom., 2d ser., p. 236.
FOOD PLANT. *Ambrosia.*

Pterophorus monodactylus. Linn.
1880. Larva, (brief.) *Walsingham.* Pterop. Cal. Oregon, p. 40.

Lioptilus homodactylus. Walker.
1881. Larva, pupa. *Kellicott.* Bull. Buffalo Soc. N. Hist., vol. 4, p. 49.
1882. Larva, pupa. *Coquillett.* Papilio, vol. 2, p. 62.
FOOD PLANTS. *Eupatorium purpureum, Solidago.*

Lioptilus helianthi. Walsingham.
1880. Larva, (brief.) *Walsingham.* Pterop. Cal. Oregon, p. 54.
FOOD PLANT. Species of *Helianthus.*

Lioptilus sericidactylus. Murtfeldt.
1880. Larva, pupa. *Mary E. Murtfeldt.* Amer. Entom., vol. 1, 2d ser., p. 235.
FOOD PLANT. *Vernonia noveboracensis.*

Lioptilus kellicottii. Fish.
1881. Larva, pupa, (brief.) *Kellicott.* Bull. Buffalo Soc. N. Hist., vol. 4, p. 51.
FOOD PLANT. *Solidago.*

Acioptilus montanus. Walsingham.
1881. Larva, pupa. *Kellicott.* Bull. Buffalo Soc. N. Hist., vol. 4, p. 51.
FOOD PLANT. *Solidago.*

APPENDIX.

Species not distinguishable by modern authors:

NOCTUIDÆ.

Hoporina hesperidago. Guen.

1856. Larva. *Guen.*, (after Abbot MS.) Spec. Gener. Noct. 3, p. 393.

FOOD PLANT. *Ostrya virginica.*

Hypogramma andromeda. Guen.

1856. Larva, (col'd fig.) *Guen.*, (after Abbot MS.) Spec. Gener. Noct. 3, p. 36, pl. 2.

FOOD PLANT. *Andromeda arborea.*

Nænia typica. L.

1869. Larva. *Bethune.* Canad. Entom., vol. 1, p. 87.

(European species not known in N. Amer.)

GEOMETRIDÆ.

Endropia putraria. Guen.

1857. Larva. *Guen.* Spec. Gener. Phalaen., p. 132.

Geometra siccifolia. Fitch.

1856. Larva. *Fitch.* 3d Rept. Ins. N. York, p. 381.

For the information of students who may be interested in the transformations of our Lepidoptera, I give references to the following admirable papers, all of which are worthy of the most careful attention:

ANDREWS, W. V.....The Cynthia Silk-worm, Amer. Naturalist, vol. 2, 1868.

BRUCE, DAVID .....Food Plants of Geometridæ, Entom. Amer., vol. 3, 1887.

BEUTENMÜLLER, WM..Food Plants of various Bombyces, etc., Entom. Amer., vols. 1, 2, 3, 1886–88.

CLEMENS, B.....Notes on Micro-lepidopterous Larvæ, Proc. Entom. Soc. Philad., vol. 1, 1861.

CHAMBERS, V. T.....Notes on Amer. Species Lithocolletis, Psyche, vol. 2, 1877.

Food Plants of Tineidæ, Bull. Geol. Survey (Hayden), vol. 4, 1878.

Habits of Leaf-mining Larvæ, Amer. Entom., vol. 1, 2d series, 1880.

Mouth-parts and Legs of leaf-mining Larvæ, Amer. Entom., vol. 1, 2d series, 1880.

EDWARDS, W. H.....Experiments with Cold on Phyc. pharos, Canad. Entom., vol. 9, 1877.

Experiments with Cold on Chrysalis of Butterflies, Psyche, vol. 3, 1878.

Effects of Cold on Chrys. of Grapta, Psyche, vol. 3.

Effects of Cold on Larva of L. Disippus, Psyche, vol. 3.

GROTE, A. R.....Larval Variation, Canad. Entom., vol. 9, 1877.

LINTNER, J. A.....Biography of Hemileuca maia, 26th Rept. N. York Cab. N. Hist., 1872.

MANN, B. P.....Descrp. Larvæ of Lepidoptera, Psyche, vol. 2, 1877.

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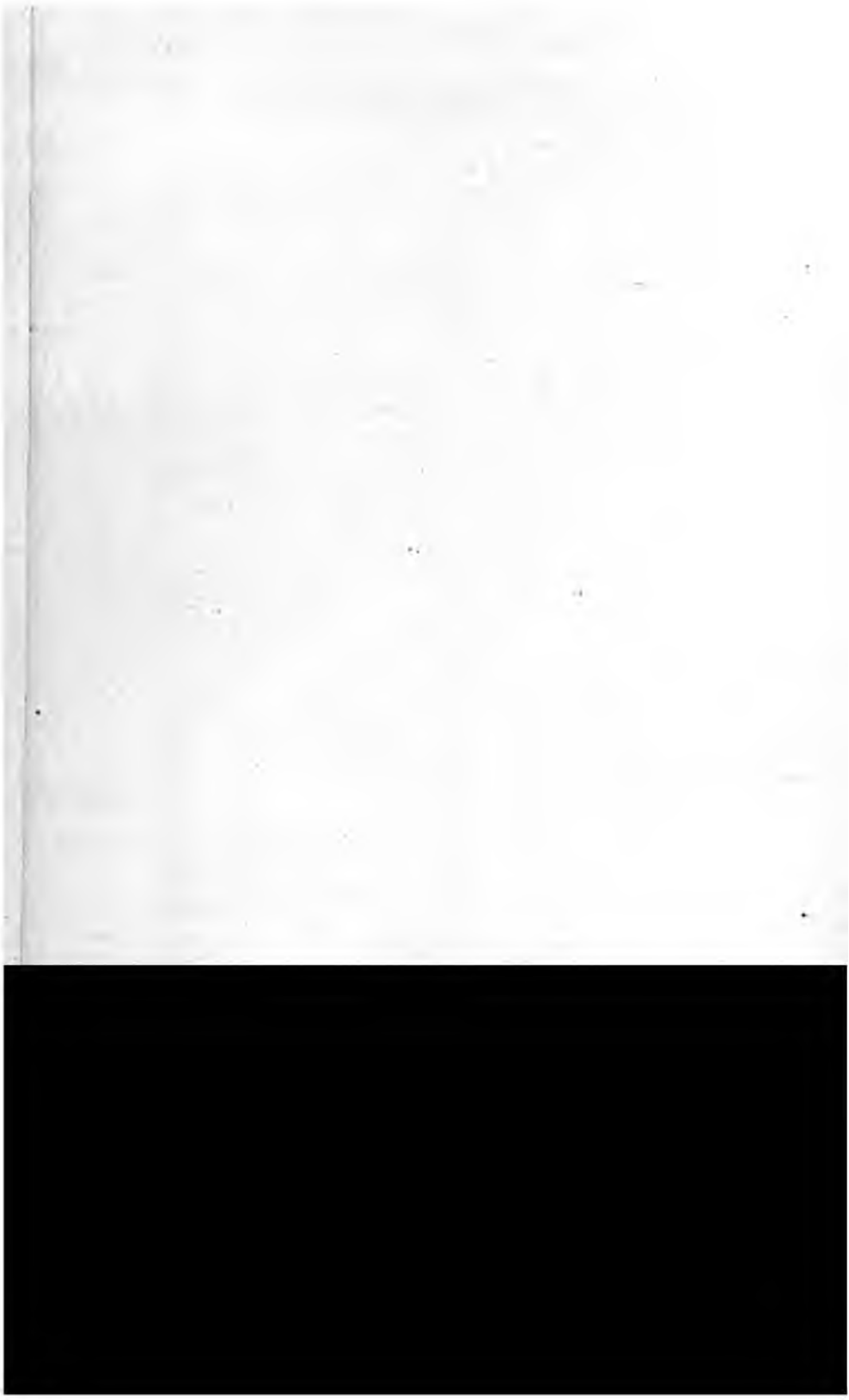

FOOD-HABIT INDEX.

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SMITHSONIAN INSTITUTION.

UNITED STATES NATIONAL MUSEUM.

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 36.

CONTRIBUTIONS TO THE NATURAL HISTORY OF THE CETACEANS,
A REVIEW OF THE FAMILY DELPHINIDÆ.

BY

FREDERICK W. TRUE.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1889.

ADVERTISEMENT.

The present publication (Bulletin No. 36) is the forty-seventh of a series of papers intended to illustrate the collections belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

The publications of the National Museum consist of two series—the Bulletins, of which this is No. 36 in continuous series, and the Proceedings, of which the eleventh volume is now in press.

The volumes of Proceedings are printed, signature by signature, each issue having its own date, and a small edition of each signature is distributed to libraries promptly after its publication.

Full lists of the publications of the Museum may be found in the current catalogues of the publications of the Smithsonian Institution.

Papers intended for publication in the Proceedings and Bulletins of the National Museum are referred to the Committee on Publications, consisting of the following members: T. H. Bean, A. Howard Clark (editor), Otis T. Mason, John Murdoch, Leonhard Stejneger, Frederick W. True,

CONTRIBUTIONS TO THE NATURAL HISTORY OF THE CETACEANS.

A REVIEW

OF THE

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FREDERICK W. TRUE,

Curator of the Department of Mammals, United States National Museum.

WITH FORTY-SEVEN PLATES.

WASHINGTON:
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PREFACE.

More than four years ago the writer formed a determination to prepare a monograph of the species of Dolphins which occur on the coasts of North America. It immediately became apparent, however, that a proper comparison of the species described respectively by European and American naturalists could not be made without an examination of the types. A large proportion of the species of the family were established by Gray, whose descriptions are for the most part too brief and vague to serve as the basis of critical comparisons, while the descriptions of some other writers on the subject are almost equally insufficient.

Such being the condition of the literature, I resolved to visit the museums of Europe and to examine all the type specimens to which I could gain access. Professor Baird, the late Director of the Museum, very kindly consented to my being absent during the winter of 1883–'84, and I accordingly spent about four months in England and on the continent of Europe in the study of the specimens in question.

During this visit I became deeply indebted for courtesies shown me by the authorities of the different museums. I wish especially to acknowledge the kind attentions of Prof. William H. Flower, who not only gave me free access to the collections of the Royal College of Surgeons, which were at that time under his charge, but furnished me much valuable information, and, in addition, placed in my hands the proof-sheets of his then unpublished paper on the *Delphinidæ*, to which I shall have frequent occasion to refer in the following pages. Acknowledgment is also especially due to Dr. Albert Günther and Oldfield Thomas, esq., of the British Museum; Prof. J. W. Clarke, of Cambridge, and Prof. H. N. Moseley, of Oxford; Dr. George E. Dobson, of Netley; Thomas J. Moore, esq., of the Liverpool Free Public Museum; Thomas Southwell, esq., of the Norwich Museum; Prof. H. Paul Gervais and Prof. Paul Fischer, of the Muséum d'Histoire Naturelle, Paris; Dr. F. A. Jentinck, of the Leyden Museum; and Prof. P. J. Van Beneden, of Louvain.

In the course of my investigations I examined and measured the majority of the types of Gray, Cuvier, Gervais, Schlegel, and other English, French, and Dutch naturalists, together with numerous other specimens. Basing my opinions on the results of this study, I shall venture to pass in review the species of the different genera of the family, giving little attention to the genera themselves.

The genera *Orca* and *Orcella* are not touched upon in this paper. The species of the latter genus need no elucidation. In the case of *Orca*, the material which I gathered is scanty, and I abstain from discussing it for fear of adding to, rather than lessening, the confusion in which the genus is involved. Many additional facts must be obtained before even a tolerably satisfactory account of the killers can be written.

In conclusion it is necessary that I should say a few words regarding Professor Flower's paper "On the Characters and Divisions of the Family Delphinidæ" (Proc. Zool. Soc. London, 1883). As I have already stated, the proof-sheets of this valuable essay were very kindly placed in my hands by the author at the outset of my studies, and I have undoubtedly been influenced, to a great extent, by the opinions therein expressed. The grounds covered by this essay and my own, however, are somewhat different. Regarding his work, Professor Flower writes:

> It is, however, not so much to specific distinctions that this research has been directed, as to discover the mutual relations of the different modifications of the Dolphin type to one another, and their association into groups which may be considered (following the custom adopted in the arrangement of other groups) of generic value.*

My own work, on the contrary, has been directed not at all toward the distinction of genera, but rather toward the determination of species.

I have accepted the generic divisions employed by Professor Flower for the most part without alteration, as the basis of my work.

* Flower: Proc. Zool. Soc. London, 1883, p. 469.

SYSTEMATIC INDEX.

INTRODUCTION.

§ 1. REMARKS UPON THE DISTINCTION OF SPECIES AND UPON SUB-FAMILY DIVISIONS.

The writer is fully aware that the time is not yet ripe for a final review of the family *Delphinidæ*. The work now accomplished must be regarded as provisional and subject to revision in the future.

Some of the great hindrances to the study of the dolphins—the scarcity of material, the ignorance of the limits of specific variation, and the like—have already been pointed out by Professor Flower, and it is not necessary that I should dwell upon these points. One other difficulty which is encountered by every student of the Cetacea arises from the incompleteness of the descriptions of species. In numerous cases only the external appearance of the species is described (and this from a single individual), the description being accompanied by one or two measurements, such as the total length or the greatest girth. In other instances, equally numerous, species are described from a single skull. It is evident that if this condition of affairs affected the entire family there would be two series of species: First, those founded on external appearance alone; and, second, those founded on osteological characters alone. Such a condition of affairs does, indeed, to a large extent prevail and has proved the cause of much confusion.

A naturalist can, however, scarcely be regarded as deserving censure for having described the skeleton of a species the external appearance of which is unknown to him. If the description is full and accurate it must be accepted, and zoologists must be content to wait patiently until the acquisition of new specimens makes a complete description possible.

Some writers, however, seeking to avoid the difficulty arising from this multiplication of names, have produced confusion in another way. Having come into the possession of fresh specimens, or of drawings accompanied by collectors' notes on the external appearance, they have identified the former with species insufficiently described by previous writers from external characters alone, and, without [illegible] measurements of the exterior, [illegible]

It [illegible] approaching [illegible]

INTRODUCTION.

§ 1. Remarks upon the Distinction of Species and upon Subfamily Divisions.

The writer is fully aware that the time is not yet ripe for a final review of the family *Delphinidæ*. The work now accomplished must be regarded as provisional and subject to revision in the future.

Some of the great hindrances to the study of the dolphins—the scarcity of material, the ignorance of the limits of specific variation, and the like—have already been pointed out by Professor Flower, and it is not necessary that I should dwell upon these points. One other difficulty which is encountered by every student of the Cetacea arises from the incompleteness of the descriptions of species. In numerous cases only the external appearance of the species is described (and this from a single individual), the description being accompanied by one or two measurements, such as the total length or the greatest girth. In other instances, equally numerous, species are described from a single skull. It is evident that if this condition of affairs affected the entire family there would be two series of species: First, those founded on external appearance alone; and, second, those founded on osteological characters alone. Such a condition of affairs does, indeed, to a large extent prevail and has proved the cause of much confusion.

A naturalist can, however, scarcely be regarded as deserving censure for having described the skeleton of a species the external appearance of which is unknown to him. If the description is full and accurate it must be accepted, and cetologists must be content to wait patiently until the acquisitions of new specimens make a complete description possible.

Some writers, however, seeking to avoid the difficulty arising from this multiplication of names, have produced confusion in another way. Having come into the possession of fresh specimens, or of skeletons, accompanied by collectors' notes on the external appearance, they have identified the former with species insufficiently described by previous writers from external characters alone, and, without giving figures or measurements of the exterior, have proceeded to describe the skeleton. It is evident that a student approaching the subject at a later date has

only the author's bare statement that the external characters of the individual whose skeleton is described were identical with those of a previously-described species.

In the case of species founded upon single skulls, absolute certainty as to their distinctness can be reached only when large series of individuals known to be alike in their external and skeletal characters shall have been acquired. When such series shall be at command, the limits of specific variation can be determined with accuracy, and it will be possible to judge whether the characters held out as distinguishing the species in question are really of specific value or only represent such variations as are common among individuals of the same species. In the mean time it is only possible in many cases to form opinions which may or may not coincide with the truth.

In this, as in all other families of animals, an arrangement of the genera in a single linear series does violence to their natural affinities, while the attempt to introduce subfamily distinctions, with a view of approximating the arrangement more closely to a natural sequence, is here attended with great difficulties. Dr. Gill* has recognized four subfamilies: *Pontoporiinæ*, *Delphinapterinæ*, *Delphininæ*, and *Globiocephalinæ*. The genus *Pontoporia* (=*Pontoporiinæ*) I do not regard as belonging to the *Delphinidae*, and shall, therefore, omit all further reference to it. The *Globiocephalinæ* (=*Globicephalus* and *Grampus*) are characterized as having "digits (second and third) segmented into numerous phalanges," and to this are opposed the *Delphinapterinæ* and *Delphininæ*, which have "digits (second and third) not segmented into more than 5–6 phalanges each." The facts do not appear to warrant this distinction, since *Delphinus delphis* commonly has from seven to nine phalanges in the second digit, and *Tursiops tursio* and other species seven phalanges, which figures also represent the number of phalanges in the second digit of *Grampus*.

The character which Dr. Gill employs for the separation of the *Delphininæ* from the *Delphinapterinæ* seems to me to be of much greater importance. This relates to the condition of the cervical vertebræ. In *Monodon* and *Delphinapterus* (=*Delphinapterinæ*) the cervicals are all distinct, while in the other genera of the family they are more or less consolidated. I should be inclined, therefore, to unite Dr. Gill's *Delphininæ* and *Globiocephalinæ* under the former name, and to oppose to them the *Delphinapterinæ* as a second subfamily. I am the more inclined toward the adoption of this division on account of having discovered a character, which, in addition to that of the separate cervicals, is common to *Monodon* and *Delphinapterus*, but wanting in the other genera. This is that in the narwhal and white whale the pterygoid bones, instead of merely forming the walls of the posterior nares, extend backward in the form of broad plates across the optic canal and articulate with the squamosals.

*Gill. Arrangement of the Families of Mammals, 1872, p. 95.

This arrangement of parts is not to be found in other genera of the *Delphinidæ*, but is characteristic of the fluviatile dolphins (*Platanista*, etc.), to which indeed the *Delphinapterinæ* show many marks of affinity. Their separate cervical vertebræ, prolonged pterygoids, broad pectorals, and rudimentary dorsal fin, taken together, entitle them, I believe, to be regarded as a distinct subfamily. Elsewhere in the group I do not perceive that broad divisions are called for. Professor Flower employs provisionally the characters furnished by the shape of the head as a means of dividing the family into two groups. These characters, as Professor Flower himself admits, though useful and seemingly in accordance with natural affinities, within certain limits, are not trenchant.

The characters of the two divisions as regards the form of the head are as follows:*

a. With rounded head, without distinct rostrum or beak. (Among the genera included here are *Cephalorhynchus* and *Lagenorhynchus*.)

b. Dolphins with distinctly elongated rostrum, or beak, generally marked off from the antenarial adipose elevation by a V-shaped groove. (Comprises *Delphinus*, *Tursiops*, *Prodelphinus*, *Steno*, and *Sotalia*.)

Leaving *Monodon* and *Delphinapterus* out of consideration, this distinction is valid for the majority of the genera, but is broken down by *Lagenorhynchus* and *Cephalorhynchus*. In the former genus (included in section *a*) the beak, though shorter than in *Tursiops* (included in section *b*), is quite distinct and well marked off from the forehead, while in some species of *Cephalorhynchus* the head is certainly not "rounded" in the sense of being globose, but is conical.

The second character of the sections has to do with the length of the rostrum as compared with the total length of the skull. Here again *Lagenorhynchus* and *Cephalorhynchus* appear intermediate. *Cephalorhynchus eutropia* (section *a*) has the beak relatively as long as *Tursiops tursio* (section *b*); the same is also true for some species of *Lagenorhynchus*.

In spite of these considerations, however, I have employed these characters in the artificial keys to the genera, given on pages 152 and 153, believing them to be as useful, for that purpose at least, as any which can be formulated at present.

Among the supergeneric distinctions employed by Professor Flower is one which was brought into requisition for the first time and seems to be of value; this relates to the position of the two pterygoid bones. In a number of genera these bones meet in the median line of the palate, while in others they are widely separate. The value of this distinction is, however, diminished by the fact that in some species of *Lagenorhynchus* these bones are in contact, while in others they are widely divergent; also by the fact that the two positions appear to occur in some species, *e.g.*, *Sotalia gadamu*, as an individual variation. Within certain limitation, however, the character is apparently of much value.

* Characters and Divisions, pp. 501 and 511.

§ 2. Measurements.

At the beginning of my studies in the European museums I adopted a series of measurements which I applied uniformly to all specimens. It was not long before I perceived, however, that certain of them were of less value than others in the discrimination of species. I include them all in the tables in the hope that they may have value in some other connection.

The measurements are given uniformly in centimeters. The total length of the skull is measured from the center of a line joining the surfaces of the occipital condyles to the extremity of the rostrum. The length of the rostrum is obtained by measuring from the extremity of the same to the center of a line joining the bases of the maxillary notches. The orbital breadth is the distance between the centers (antero-posteriorly) of the margins of the orbits. The temporal fossæ being in most cases elliptical, the measurements of their length and breadth are made along their major and minor axes.

§ 3. Abbreviations.

There are a number of works upon the *Delphinidæ* to which I shall have need to refer so frequently in the succeeding pages that I have adopted for convenience certain abbreviations of their titles. These works are as follows:

Title.	Abbreviation.
J. E. Gray. Catalogue of Seals and Whales in the British Museum. 2d ed., London, 8°, 1866.	Catalogue.
J. E. Gray. Synopsis of the Species of Whales and Dolphins in the Collection of the British Museum. London, 4°, 1868.	Synopsis.
J. E. Gray. Supplement to the Catalogue of Seals and Whales in the British Museum. London, 8°, 1871.	Supplement.
Wm. H. Flower. On the Characters and Divisions of the Family *Delphinidæ*. Proceedings, Zoological Society of London, 1883, pp. 466-513.	Characters and Divisions.
Wm. H. Flower. List of the Specimens of Cetacea in the Zoological Department of the British Museum. London, 8°, 1885.	List.

REVIEW OF THE SPECIES OF DOLPHINS.

SUBFAMILY I. DELPHININÆ.

1. SOTALIA Gray.

Sotalia, Gray, Cat. Seals and Whales, Brit. Mus., 2d ed., 1866, p. 401; Synopsis, 1868, p. 6; Supplement, 1871, p. 67.

The type of this genus is the *Delphinus guianensis* of Van Beneden.

Of the characters assigned to the genus by Gray (l. c.) and by Professor Flower (Characters and Divisions, p. 513) only three seem to me of real value as distinguishing it from *Tursiops* and *Steno*. These are (1) the separation of the pterygoids; (2) the more limited number of the caudal vertebræ; and (3) the greater number of teeth. The somewhat unusual breadth of the base of the pectoral fin is shared by *Steno*. The unusual length of the symphysis of the mandible which has also been cited as a generic character seems to me of little value, since it is not shared by all the species. Although in *S. plumbeus*, *lentiginosus*, and *sinensis* the symphysis occupies about one-third of the ramus of the mandible, in *S. tucuxi* and *gadamu* it occupies only about one-fifth.

The genus, as already intimated, is very closely related to *Steno* and *Tursiops*, both in its external form and its osteology. It shows some relationship, however, to *Platanista*, *Inia*, and *Pontoporia* in the comparatively small number of its vertebræ and the length of their centra.

It will be necessary for me to treat of the species with much reserve since I did not have the opportunity of examining carefully all the types and must therefore base my opinions partly upon the descriptions and drawings which have hitherto been published.

SOTALIA GADAMU (Owen).

Delphinus (*Steno*) *gadamu*, Owen, Trans. Zool. Soc. London, VI, 1866, p. 17, pl. III, figs. 1–2.

Sotalia gadamu Flower, Proc. Zool. Soc. London, 1883, pp. 489 and 513.

This species is the first treated of in Sir Richard Owen's memoir upon the Indian cetacea. His material consisted of drawings and a defective skull (1477*b*) which is now in the British Museum. The mandible which

bears the same number as this cranium (1477*b*) and was figured as belonging with the latter (Trans. Zool. Soc., VI, pl. 4), in reality belongs to a second and perfect cranium (1477*a*), which, although not mentioned by Sir Richard Owen, was apparently received with the type. This last-mentioned skull is wrongly labeled "No. 423. Type." A third skull (82: 1, 2, 3) is also in the collection. In the Cambridge Zoological Museum there is a fourth skull (573*a*) derived, according to the label, from Wollongong.

These four specimens agree well together; the Cambridge skull alone presents any important differences. The differences observable in this case relate to the comparative breadth of the skull and are very probably sexual. The pterygoids in specimens 1477*b* (type) and 1477*a* differ considerably in shape, but such variations are of frequent occurrence, and here at least, in my judgment, are not to be regarded as of specific value.

There are in the British Museum two stuffed skins of this species which though smaller than Sir Richard Owen's specimen agree well with it in proportions, except so far as regards the length of the pectoral fins. The following measurements taken from these skins are in right lines, except the distance from the extremity of the snout to the dorsal fin, in measuring which the curve of the back was followed:

Measurements of two mounted skins of Sotalia gadamu.

Measurement.	British Museum.	
	No. 82: 1, 2, 3.	No. 83: 11, 20, 3.
	Inches.	*Inches.*
Total length	63.0	62.75
Tip of beak to corner of mouth	8.15	9.75
Tip of beak to eye	9.6	10.5
Tip of beak to elevation of head	3.95	4.0
Tip of beak to blowhole	10.30	10.75
Tip of beak to anterior base of pectoral fin	15.0	16.25
Tip of beak to anterior base of dorsal fin	28.0	27.8
Length of base of dorsal fin	9.0	9.0
Height of dorsal fin (vertical)	5.5	5.7
Length of pectoral fin (from anterior base)	10.75	.....
Breadth of flukes (tip to tip)	16.75	12.4
Greatest breadth of pectoral fin	4.0	3.65
Teeth (about)	.....	{ 28–28 / 28–28

S. gadamu does not appear to be very closely related to the other species of the genus. The differences which separate it from *S. lentiginosus* will be considered in the section devoted to that species (p. 16). From *S. sinensis* and the South American species it differs widely as regards size of beak, number of teeth, etc., and the skeleton, when known, will probably show that similar differences extend to other parts of the body.

The skull shows decided affinities to *Tursiops*, from some species of which, were the pterygoids united, it would be very difficult to distinguish it.

Measurements of three skulls of Sotalia gadamu.

Catalogue number.	Collection.	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
						At base of maxillary notches.	At its middle.		
				Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
1477*a*	Brit. Museum	India	♀	†47.7	†28.7	10.6	5.2	3.0	8.0
82. (1, 2, 3)	....do	Kurrachee Mus.	....	43.2	25.3	9.3	5.0	2.7	7.6
573*a*	Cambridge Museum	Wollongong	....	43.0	25.4	10.5	5.8	3.2	7.6

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*		
1477*a*	.....	6.7	†32.8	†33.8	18.5	13.7	10.2	7.0	.....	.....	.....	.....	..	26+25+ / ?—?
82. (1, 2, 3)	20.7	5.1	29.0	29.8	17.2	14.5	8.8	6.3	35.4	*5.8	20.3	7.1	.6	25—? / 25—25
573*a*	20.4	.....	28.4	29.8	19.0	15.6	9.0	7.2	36.2	*5.6	.....	.....	..	26—25 / 25—25

* This is the length of the symphysis proper; the length of the rugose area is about 11,7 cm.

SOTALIA LENTIGINOSA (Owen).

Delphinus (*Steno*) *lentiginosus*, Owen, Trans. Zool. Soc. London, VI, 1866, p. 20, pl. V, figs. 2 and 3.

Sotalia lentiginosus, Flower, Proc. Zool. Soc. London, 1883, p. 489 and 513.

The only specimens of this species which I found in the European collections are the type skull (1476*a*) with its mandible (1477*a*) and a second broken mandible (1476*a*), all of which are in the British Museum.

Sir Richard Owen showed his recognition of the true affinities of the species by placing it in Gray's genus *Steno*, which, at the time he wrote, included both species with united pterygoids and those with separate pterygoids. He very properly separated the present species from *S. gadamu*, in consideration of the difference in the relative length of the beak, the number of teeth, and some other characters of the skull, apparently of less moment. Professor Flower, however, seems to doubt the distinctness of the two species. He writes:

> *D. lentiginosus*, Owen, from the same locality [as *S. gadamu*], described in the same memoir, is a closely allied species, if distinct. (*List*, p. 489.)

The doubt expressed in the last clause of this sentence I do not share. In addition to the differences pointed out by Sir Richard Owen, viz., the

existence in *S. lentiginosa* of (1) a relatively longer beak, (2) flatter intermaxillæ (3) a longer tooth-row, and (4) more numerous teeth, I find (5) that the symphysis of the mandible is longer than in *S. gadamu*, (6) the temporal fossæ are larger, (7) the pterygoids are longer, and (8) the interorbital breadth less (see table of measurements below). The whole relative arrangement of the bones of the inferior surface of the skull differs in the two species.

In regard to external appearance, if the figures published by Sir Richard Owen are to be relied upon, the two species, *S. lentiginosa* and *S. gadamu*, are very different (T. Z. S., VI, 1866, pl. 3 (*S. gadamu*), pl. 5, figs. 2, 3 (*S. lentiginosa*). In addition to the difference in color and style of marking, the proportions of the pectoral fin, as presented both by the measurements and in the plates, are such as would alone suffice for the separation of the two species. The length of this member in *S. gadamu* is fully 22 per cent. of the entire length of the animal, while in *S. lentiginosa* the former length is less than 13 per cent. of the latter. Differences of almost equal magnitude exist in the proportions and relative positions of other members of the body. The value of these distinctions, however, would be greatly enhanced if we could be sure that the measurements were derived from the specimens themselves and not from the drawings. Unfortunately the intimation derived from the first paragraph of Sir Richard Owen's paper is that they were derived from the drawings. Even should such prove to be the case, the differences in the skulls remain, and these alone, in my estimation, are sufficient to warrant the separation of the species.

Measurements of the type skull of Sotalia lentiginosa.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of maxillary notches.	Breadth of beak— At its middle.	Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
1476*a*	Brit. Museum.	*D. lentiginosus*..	Vizagapatam.	?	47.0	28.2	10.2	4.7	3.2	7.6

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to— Anterior margin of superior nares.	Extremity of beak to— End of crest of pterygoid.	Breadth between— Orbits.	Breadth between— Hinder margins of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
1476a	25.3	3.8	31.7	34.9	17.4	14.7	10.2	8.0	39.9	*12.1	23.9	7.9	0.43	{ 34–34 / 33–34

*This is the extent of the rougose are[illegible] symphysis is about 5.3 cm.

SOTALIA GUIANENSIS (Van Beneden).

Delphinus guianensis, Van Ben., Mém. Couron. Acad. Royale Belg., coll. in 8°, XVI, 1864, art. 2, 1 pl.
Sotalia guianensis, Gray, Cat. Seals and Whales, Brit. Mus., 1866, p. 401.

SOTALIA BRASILIENSIS E. Van Beneden.

Sotalia brasiliensis, E. Van Ben., Mém. Acad. Royale Belg., XLI, 1875, art. 1, pls. 1 and 2.

SOTALIA PALLIDA (Gervais).

Delphinus pallidus, Gervais, Castelnau Expéd. dans l'Amér. Sud, pt. VII, Zoologie, 1855, p. 94, pl. XIX, figs. 1-2.
Sotalia pallida, Van Ben. and Gervais, Ostéog. des Cétacés, 1880, p. 595.

SOTALIA TUCUXI (Gray).

Steno tucuxi, Gray, Ann. and Mag. Nat. Hist., 2d ser., XVIII, 1856, p. 158.
Sotalia tucuxi, Flower, Proc. Zool. Soc. London, 1883, p. 513.

SOTALIA FLUVIATILIS (Gervais).

Delphinus fluviatilis, Gervais, Bull. Soc. d'Agric. Hérault, XL, 1853, p. 148 (*sine descr.*).
Sotalia fluviatilis, Van Ben. and Gervais, Ostéog. des Cétacés, 1880, p. 596.

Of these five nominal species, one, *S. guianensis*, is from Cayenne; three from the Amazon River, *S. pallida*, *tucuxi*, and *fluviatilis;* and one, *S. brasiliensis*, from the bay of Rio de Janeiro. At least two skeletons of *S. guianensis* are to be found in the European collections and one of *S. brasiliensis*. The latter, however, is that of so young an animal as to make comparisons of little value. The description of *S. tucuxi* was drawn from two skulls in the British Museum. A skull of *S. fluviatilis* is said to be in the Paris Museum,* but is not figured by Van Beneden and Gervais in the Ostéographie.† These authors, however, figure and describe portions of a skeleton of *S. pallida*, also said to be in the Paris Museum.

Professor Flower justly remarks that the materials are not at present sufficient for the proper determination of these species. Nevertheless, several opinions have been advanced regarding them. M. Ed. Van Beneden has brought forward characters which he views as distinguishing *S. brasiliensis* from *S. guianensis*. The authors of the Ostéographie apparently held the same view, and at the same time united *S. fluviatilis* to *S. pallida*. Gray believed that *S. tucuxi* might also be identical with *S. pallida*, while Professor Flower finds it difficult to distinguish between these two species and *S. brasiliensis*.

It is only between *S. guianensis* and *S. brasiliensis* that comparisons of any moment have been made, and the value of these is unfortunately

* Mém. Acad. Belg., XLI, 1875, art. 1, p. 4.

† The references to the figures of *Sotalia* in this work are very confusing. The legend of plate XLI is as follows: "1-5, S. guyanensis. 6-17, S. pallida." In the "explication des planches," however, all the figures on this plate are placed under the heading of *S. guyanensis*, while in the text (p. 596) fig. 7 is referred to as *S. fluviatilis*.

diminished by the fact that the specimen of *S. brasiliensis* is very young. The characters drawn out by M. Ed. Van Beneden are as follows:

Characters.	S. guianensis.	S. brasiliensis.
1. Size	greater.	smaller.
2. Number of vertebræ	55	54
3. Number of ribs (pairs)	12	11
4. Number of sternal ribs (pairs)	7	6
5. Number of pieces in sternum	3	1 (of bone); 1 (of cartilage).
6. Number of teeth	32 / — / 29	34 / — / 33
7. Ear-bones	smaller.	larger and peculiar.

On account of the immature condition of the specimen of *S. brasiliensis*, characters 1 and 5 are manifestly of little importance. The differences represented in characters 2, 3, and 6 are within the range of individual variation, as has been abundantly proved by the examination of various species. Characters 4 and 7, therefore—the number of sternal ribs and the size and form of the ear-bones—alone constitute recognizable distinctions between the two species. Of these two characters, the first is quite likely to be merely an individual difference; but the second can not of course be so considered.

Between *S. fluviatilis* and *S. pallida* the following distinctions are made:

Color—

S. fluviatilis: Body black above, rose-pink below; pectorals colored like the back.

S. pallida: Body fulvous above, white below; pectorals not colored like the back.

Pectoral fins—

S. fluviatilis: Quite large and pointed.

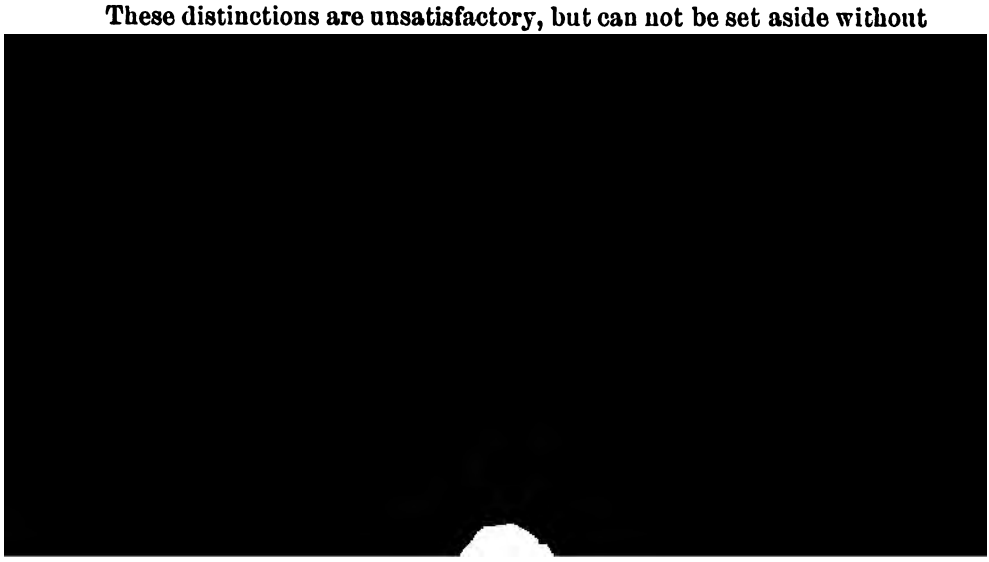
S. pallida: Smaller, less pointed, and narrower at the base.

Dorsal fin—

S. fluviatilis: Two-thirds as high as long.

S. pallida: Less high.

These distinctions are unsatisfactory, but can not be set aside without



Besides the original descriptions of the different species, we have Natterer's account of a specimen of river-dolphin harpooned at the mouth of the Rio Negro.* The specimen, which was a male, is represented as having been ashy-gray above and violet-gray below, with fins colored like the back. In coloration, therefore, it agreed tolerably well with *S. fluviatilis*. Natterer gives a number of measurements, but we have only the measurements of *S. brasiliensis* with which to compare them. From these it appears that the latter species has shorter pectoral fins, higher dorsal fin, and narrower flukes than had Natterer's specimen.

These differences give some strength to the opinion that the marine species, *S. brasiliensis* and *S. guianensis*, are distinct from the fresh-water species.

Von Pelzeln is inclined to support Gray's opinion that all the nominal river species are identical. He states, however, that Bates mentions *S. pallida* as occurring in the lower Amazon, which does not appear to be a fact. Bates's words are as follows:

> In the upper Amazons a third pale, flesh-colored species is also abundant (the *Delphinus pallidus* of Gervais).†

The species which he found at the mouth of the Tocantins River is the "*Steno tucuxi* of Gray."

In this unsatisfactory condition our knowledge is, unfortunately, likely to remain, until more material has been collected. The skeletons of a number of adult individuals, and observations upon the variation of the color and of the proportions of the pectoral and dorsal fins among members of the same school, are requisite to solve the problems which these five nominal species present.

Skulls Nos. 1189*a*, ♂, and 1189*b*, ♀ in the British Museum, the types of *S. tucuxi* are those of young animals, as is indicated by the exposure of a considerable portion of the frontal behind the maxilla and the distinctness of the occipito-parietal suture. The intermaxillæ are short proximally, and the maxillæ are visible on the anterior and lateral margins of the anterior nares. The ridge of the mesethmoid is higher than the triangular prenarial area in its middle part, and is thickened, forming a transverse ridge. The intermaxillæ are broadest and quite flat near the middle of the rostrum. The prenarial triangle is concave. The nasals are small in the male, and present only a thick upper edge.

The inner margins of the pterygoids in this specimen are separated at the extremity by an interval of about 28^{mm} and at the base are about 5^{mm} apart. The outline of these bones in the two sexes is somewhat different. The intermaxillæ and vomer appear in the median of the palate anteriorly in No. 1189 *a* for a distance of about 116^{mm}. The crowns of the teeth are tinged with brown, the roots are open. The ramus of the mandible is flat internally.

A skull recently purchased by the National Museum agrees very

* Brasilische Säugethiere. Resultate von Johann Natterer's Reisen in den Jahren 1817 bis 1835. Dargestellt von August von Pelzeln. Wien, 1883. Pp. 95-96.

† Bates, Naturalist on the Amazons, 1864, p. 88.

closely with these, but is larger, and evidently belonged to an older individual. The beak is relatively longer. I regard it identical with *S. tucuxi*, and have included it in the table of measurements under that name. It is said to have come from Florida, but the evidence is not entirely satisfactory. This skull also agrees well in proportions and details of structure with that figured by Van Beneden and Gervais under the name of *S. pallida* (Ostéographie, pl. XLI, fig. 6).

Van Beneden's measurements of the exterior and skull of his *S. brasiliensis* are appended for convenience of reference:

Measurements of Sotalia brasiliensis.

Exterior:	Metres.
Total length	1.21
Extremity of beak to eye	0.18
Eye to base of pectoral	0.14
Length of the base of the pectoral at its insertion	0.06
Pectoral to extremity of spinal column	0.82
Extremity of beak to base of pectoral	0.30
Vertical height of body in front of the dorsal	0.28
Greatest height of the tail	0.12
Length of the pectoral	0.155
Height of the dorsal	0.11
Total breadth of the flukes	0.32
Skull:	
Total length	0.305
Length of beak	0.165
Antero-posterior diameter of cranial cavity	0.100
Breadth of skull between temporal fossæ	0.130
Breadth at the zygomatic apophyses of temporal	0.136
Height of skull between the crest and the bason	0.110
Breadth of beak at last tooth	0.052
Height at same point	0.022
Height of foramen magnus	0.042
Greatest breadth of same	0.035
Breadth of one of the occipital condyles	0.022
Greatest diameter of condyle	0.038

Measurements of three skulls of Sotalia tucuxi.

Catalogue number.	Collection.	Type of—	Locality.	Sex.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillary at middle of beak.	Greatest breadth between outer margins of intermaxillary proximally.
							At base of maxillary notches.	At its middle.		
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
1189*a*	Brit. Mus.*.....	*Steno tucuxi* ..	Amazon River.	♂	30.9	17.1	6.3	3.5	2.2	5.3
1189*b*	....do.*.....	....do	....do	♀	29.2	16.5	5.8	3.0	2.0	4.8
21499	U. S. Nat. Mus ..	.....	Florida (†)	....	35.3	20.8	7.1	4.1	2.4	5.5

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extent of beak to—		Breadth between—		Temporal fossæ—		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins at temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*		
1189*a*	14.5	3.5	20.3	21.1	11.6	10.6	7.1	5.2	23.6	4.7	13.9	5.1	0.38	{ 28—29 / 30—30
1188*b*	14.2	3.2	19.3	20.1	10.6	10.2	6.3	5.3	.....	.....	.....	.....	.....	.....
21499	18.3	3.5	24.4	25.2	12.9	11.1	7.4	6.1	29.7	6.3	.....	6.3	.....	{ 31—33 / 32—30

* Collected by Bates. † The maxillæ have sprung apart.

SOTALIA PLUMBEA (Cuvier).

Delphinus plumbeus, Cuvier, Règne Animal, 2d ed., I, 1829, p. 283; Pucheran, Rev. et Mag. de Zool., 2d ser., VIII, 1856, pp. 145, 315, 362, 449.
Sotalia plumbeus, Flower, Proc. Zool. Soc. London, 1883, p. 513.
Steno plumbeus auct.

In the elaborate critique upon the relationships of this species published by Pucheran in 1856, the evidence upon which it was united to *D. malayanus,* Lesson, *D. dubius,* Cuvier, and other species, was very carefully sifted and the conclusion arrived at that it must be considered distinct and valid.

In its proportions and general appearance the type skull (*a*3053) resembles that of *S. lentiginosa,* but the differences are such that it can not be united with that form, at least upon the basis of the present scanty material. "*Delphinus plumbeus,* Dussumier," writes Professor Flower, "represents the longest and narrowest form of this type, with the most numerous teeth." (Characters and Divisions, p. 489). The beak is longer and more compressed than in *S. lentiginosa,* and the brain-case is decidedly narrower.

So far as external appearances are concerned there are apparently few points of resemblance between the two species. The depression and great extent of the dorsal fin, so strongly insisted upon by Pucheran as a character of *S. plumbea*, is not shared by *S. lentiginosa*, and the measurements do not agree. The color of the body of *S. plumbea* is described by F. Cuvier as being of "une teinte uniforme d'un gris plombé, excepté l'extrémité et le dessous de la mâchoire inférieure, qui sont blanchâtres."* The color of *S. lentiginosa*, according to Professor Owen, is "pretty uniformly bluish cinereous, or slaty, freckled with irregular small spots or streaks of brown or plumbeous pigment, the streaks longitudinal and flecked with white; the under surface is a shade lighter than the rest of the body."†

I think we may look upon the two species as distinct, and do not fear that future evidence will invalidate this conclusion.

Table of measurements of the type-skull of Sotalia plumbea.

Catalogue number.	Collection.	Type of—	Locality.	Age.	Total length.	Length of beak.	Breadth of beak—		Breath of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
							At base of maxillary notches.	At its middle.		
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
a3053	Mus. d'Hist. nat.‡	*S. plumbea*	Malabar	Ad.	55.9	34.9	11.2	4.3	2.8	8.4

number.	tooth-line.	o base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		mandible.	symphysis mandible.	tooth-row of mandible.	ween angle and id process.	nterior nares.	teeth.
			argin of nares.	rest of bid.		grins of fossæ.								

SOTALIA SINENSIS Flower.

Delphinus chinensis, Osbeck, Voyage to China in 1751, p. 12 (without description); Desmarest, Encycl. méthod. ("Mammalogie"), 1822, p. 514. (From Osbeck without description.)

Delphinus sinensis, F. Cuvier, Hist. nat. des Cétacés, 1836, p. 213. (From Osbeck without description.)

Delphinus sinensis, Flower, Trans. Zool. Soc. London, VII, 1870, p. 151.

Sotalia sinensis, Flower, Proc. Zool. Soc. London, 1883, p. 513.

This species, which from the time it was originally observed by Osbeck in 1751, stood among the forms *incertæ sedis*, was formally described by Professor Flower, in 1870, on the basis of two skeletons collected by Mr. Swinhoe in the harbor of Amoy. Although, through the kindness of Professor Flower, I was enabled to examine the types of the species, I can add nothing to his concise and sufficient account, and will simply quote the paragraphs in which the distinctive characters are set forth:

The principal differences between this skeleton and that of all other Dolphins lie in the vertebral column. The total number of vertebræ is less [viz: C. 7 D. 12, L. 10; Ca. 22=51], the individual vertebræ are proportionally longer, and their transverse processes are shorter and broader than in any other species. Next to it in these characters stands *D. guianensis* (genus *Sotalia*, Gray), which has the following vertebral formula: C. 7, D. 12, L 14, C. 22=55; then *D. tursio*, which has C. 7, D. 13, L. 17, C. 25=62.* 'The live animal is of a milky white, with pinkish fins and black eyes.'† The numbers of the teeth of the adult specimen of *D. sinensis*, as indicated by the alveoli, are $\frac{33-32}{32-31}$, total 128.‡

The localities in which the species is known or believed to occur are the harbor of Amoy, Canton River, and Foochow River.

A good figure of the exterior and measurements are still desiderata. Measurements of the skull are given in the synopsis.

2. STENO Gray.

<*Steno*, Gray, Zoology Erebus and Terror, 1846, p. 43; Cat. Cetacea Brit. Mus., 1850, p. 127; P. Z. S. London, 1864, p. 236; Cat. Seals and Whales Brit. Mus., 1866, p. 232; Supplement, 1871, p. 65; Van Beneden & Gervais, Ostéographie des Cétacés, 1880, p. 592.

><*Glyphidelphis*, Gervais, Zool. et Paleont. Franç., 1859, p. 301.

=*Steno*, Flower, Proc. Zool. Soc. London, 1883, p. 513.

Only three characters of importance have been brought forward as distinguishing this genus from its nearest ally, *Tursiops*. These relate to the (1) compression of the beak, (2) the elongation of the symphysis of the mandible, and (3) the rugosity of the teeth. The first two of these characters impress upon the mandible a peculiar form, which is widely different from that existing in *Tursiops*. The rami are concave

* Trans. Zool. Soc., London, VII, 1870, p. 159. The number of vertebræ in the genera *Monodon* and *Delphinapterus*, which is only 50, is not taken into consideration by Professor Flower in this connection. † Loc. cit., p. 152. ‡ Loc. cit., 155.

outward, and as the symphysis is not keeled the terminal portion of the mandible has the least depth, which is not the case in *Tursiops*. In the last-named genus the beak is depressed, while in *Steno* it is compressed. The teeth are equally numerous in the two genera, but in *Steno* the crown is rugose. As regards the vertebræ, the number in four regions of the body is practically alike in both genera, but, according to the measurements given by Dr. Peters for *S. perspicillatus*, the combined length of cervical vertebræ would appear to be considerably greater in *Steno* than in *Tursiops*.

From *Sotalia* the present genus is distinguished by its conjoined pterygoids and its less numerous and rugose teeth.

STENO ROSTRATUS (Desmarest).

Delphinus rostratus, Cuvier, Desmarest, Nouv. Dict. d'Hist. nat., IX, 1817, p. 160; Mammalogie, 1822, p. 515.

Delphinus rostratus, Shaw (?), Cuvier, Ann. du Muséum, XIX, 1812, p. 10.

Delphinus frontatus (pars), Cuvier, Oss. foss., 2d ed., V, 1823, p. 278. (*Fide* Flower.)

Delphinus rostratus, G. Cuvier, Règne Animal, 2 ed., I, 1829, p. 289; F. Cuv., in Oss. foss., 4th ed., 1836, p. 86, 121; Hist. nat. des Cétacés, 1836, p. 156.

Delphinus bredanensis, Cuv., Lesson, Hist. Nat. des Mammif. et Oiseaux découvert depius 1788, 1828, p. 206; Van Breda, Nieuwe Verhandl. Nederl. Inst., II, 1829, pp. 235–237, pls. 1, 2.

Delphinorhynchus bredanensis, Lesson, Hist. Nat. des Mammif. et Oiseaux découvert depuis 1788, 1828, p. 441 (table méthod.).

Steno rostratus and *S. frontatus*, Gray, Zool. Erebus and Terror, 1846, p. 43.

Steno frontatus, Gray, Synop. Whales and Dolphins, 1868, p. 5.

Glyphidelphis rostratus, Gervais, Zool. and Paleon. Franç., 1859, p. 301; Ostéog. des Cétacés, 1880, p. 594, pl. XXXVII, figs. 8–11.

Delphinus planiceps, Schlegel, Abhandl. aus d. Geb. Zoologie, heft I, 1841, p. 27 (*not* Van Breda).

Steno compressus, Gray, Zool. Erebus and Terror, 1846, p. 43, pl. 27.

Delphinus Reinwardtii, Schlegel, Abhandl. Geb. Zool., heft I, 1841, p. 27, pl. 3, figs. 2, 3.

Delphinus Pernettyi, Desmarest, Mammalogie, 1822, p. 513.

The peculiar synonymy of this species has received thorough treat-

the stuffed skins which had been associated with the skulls in the Paris Museum did not belong to the same species. When Cuvier recognized the latter fact he at the same time arrived at the conclusion that Van Breda's specimen was specifically identical with the skulls in the Paris Museum. He also received from Brest a figure of a specimen which seemed to him identical with Van Breda's (*Oss. foss.*, 4th ed., VIII, pt. 2, p. 122, note). Van Breda's figure and the figure of the Brest specimen (copied by F. Cuvier), therefore, represent the exterior of the species under discussion according to Cuvier's best knowledge and belief.

In accepting his opinion, however, we meet at once with a serious difficulty. The figures referred to represent a dolphin having the beak confluent with the forehead, a point strongly insisted upon by G. Cuvier and again by F. Cuvier. But in 1876 Peters described a specimen of *Steno* the skull of which is, generically at least, identical with the skulls in the Paris Museum, but which has the beak distinctly marked off from the forehead as in the species of *Tursiops* and *Delphinus*. We have, therefore, either to consider the figures known to Cuvier incorrect, or to regard Peters' specimen as belonging to a distinct subgenus. From this dilemma nothing thus far known can save us. The figures in question are crude, but it seems scarcely probable that both would have the same defect as regards the beak. Regarding the *Steno perspicillatus* of Peters, Professor Flower says:

> If it is not specifically identical with, it is certainly very closely allied to *Steno rostratus*. (*Characters and Divisions*, p. 486.)

I examined the type-skull in 1887, through the kindness of Dr. Hilgendorf, and was unable to see wherein it differed from the ordinary *S. rostratus*. The rostrum, as indicated in Peters' figure, is rather abruptly and unsymmetrically terminated, as though the tip had been cut off. Such, however, does not appear to have been the case, and it is possible that the individual was injured by accident during life. This condition of the rostrum makes it appear that its proportional width at the middle is unusually great; according to my measurements it is 19.8 per cent. of the length. But with the explanation given I do not think that this is to be regarded as of importance. The teeth are rugose, as in ordinary specimens of *S. rostratus;* they number $\frac{24-23}{22-21}$. The premaxillæ are high, thick, and rounded.

In external form and coloration there is a close resemblance to *Tursiops tursio*, except that a dark eye-ring and forehead-line are present, as in *D. delphis*. The cervical region is longer than in *Tursiops*, but the number of vertebræ is nearly the same in both.

The facts being such as they are, it has seemed to me best to hold Peters' specimen apart, under the name of *Steno perspicillatus*, and I have, therefore, entered that species separately in the synopsis. For further remarks on the figures known to Cuvier, see p. 27.

In Cuvier's original description (Ann. du Muséum, XIX, 1812, p. 9) no single skull is mentioned, and the species, therefore, has no type. The description, however, and the figure afterwards published in the *Ossements fossiles*, would suffice for the recognition of the species were it not that others were subsequently erected on skulls closely resembling that figured by Cuvier.

The characters which have been insisted upon as separating the different species relate to the width of the beak and the number of teeth. In the first of these characters, as Professor Flower has already intimated, there is a complete gradation. The following table shows the gradation in twenty-six specimens in European museums, including the type of *S. compressus* and probably also of *S. reinwardtii:*

Comparison of the length of the beak in S. compressus, etc., taken at 100 per cent., with its width at the middle.

Collection.	Number.	Identification.	Proportional width of beak at middle.	Length of skull.	Greatest number of teeth—	
					Upper jaw.	Lower jaw.
			Per cent.	*Inches.*		
1. Leiden	24	Reinwardtii (?Type)	11.5	20.47	25	25
2. Liverpool	7, 7, 66, 31		12.0	21.0	24	24
3. Paris	*a* 3047	Rostratus	12.2	19.5	22	22
4. London (B. M.)	346 *b*	Compressus	12.6	20.5	22	24
5. London (B. M.)	346 *a*	Compressus (Type)	12.9	20.125	25	27
6. Liverpool	24, 2, 63		13.2	21.25	25	24
7. Leiden	26	Planiceps	13.3	19.92	24	25
8. Oxford	X[5] (juv.)	Rostratus	13.5	19.4	23	24
9. Oxford	1668	Rostratus	14.3	20.2	24	25
10. Liverpool	19, 11, 62		14.3	21.4	22	23
11. Liverpool	13, 11, 68, 1		14.5	20.25	23	24
12. Liverpool	*a*		14.7	21.4	23	23
13. London (B. M.)	346 *d*	Compressus	15.5	20.125	22	20
14. Leiden	None (1)	?Planiceps	15.6	19.68	21	23
15. Leiden	None (2)	?Planiceps	15.8	20.79	21	24
16. Oxford	1676	Rostratus	15.8	20.0	22	22
17. Liverpool	23, 1, 64, 2		15.8	20.25	22	21
18. Leiden	27	?Planiceps	16.2	19.2	21	22
19. Liverpool	21, 5, 62, 1		16.4	21.75	20	21
20. London (B. M.)	245 *d*	Frontatus	16.5	20.375	22	22
21. Liverpool	12, 7, 69, 1		16.9	20.6	21	21

of its length, which makes this a very broad-beaked specimen. Measurements from figures, however, are not always to be relied upon. In the description Cuvier gives the number of teeth as $\frac{26-26}{26-26}$, while the figure shows 21 in the left side of the upper jaw and 24 in the lower jaw. No. *a*3047 in the Paris Museum, labeled *S. rostratus*, and also *bredanensis*, belongs to the opposite end of the series. The breadth of the rostrum at the middle is but 12.2 per cent. of its length. This was probably one of the specimens already in the museum in Cuvier's time.

Steno compressus Gray.

The type of this species, No. 246*a* of the British Museum, is a skull with tolerably narrow rostrum and rather numerous teeth, but apparently without other characters serving to distinguish it from the skulls in the Paris Museum and in other collections. It is improbable, therefore, that it represents a distinct species.

Delphinus reinwardtii Schlegel.

The type of this species is apparently the No. 24 of the Leiden Museum. This is a large skull with a long, narrow rostrum and a rather large number of teeth $\left(\frac{24-25}{25-25}\right)$. It does not differ from the skulls which Gray called *S. compressus*, or, in other words, is a narrow-beaked individual of *S. rostratus*.

Delphinus bredanensis Van Breda.

As already stated Van Breda described this species before Cuvier had discovered that the skins originally accredited to *S. rostratus* were of quite another species. Van Breda perceived that these skins were different from that of his specimen but concluded that the case was one in which two species very different externally were alike as regards cranial characters. Van Breda's figure, however, convinced Cuvier that he was in error, and caused him to accept the same as representing the true external characters of his *D. frontatus* or *rostratus*.

Steno fuscus Gray.

Steno fuscus, Gray, Zool. Erebus & Terror, 1846, p. 44, pl. 26, fig. 1.

What the relationships of this species are, and whether it is a *Steno* at all, must probably always remain in doubt. Gray makes the following statement in regard to it:

Inhab. Cuba, W. S. MacLeay, Esq.

This species is only known by a fœtal specimen in spirit, not in a very good state. Presented to the British Museum by W. S. MacLeay, Esq.

The figure represents an animal resembling *Prodelphinus obscurus*, or indeed not unlike Van Breda's *Steno bredanensis*. The forehead is not separated from the beak by a transverse groove.

I did not see the specimen when in London, and if my memory serves me, was informed that it could not be found. Even if it still exists, however, I think the same ruling should be applied in this case as in that of *Tursiops cymodice*, regarding which Professor Flower says:

> *T. cymodice* may be at once expunged from the list. It is founded upon a single skull of a very young animal; the basilar suture is not closed, and all its distinguishing characters are those of immaturity. It is impossible to say even of which variety it is the young. (*Characters and Divisions*, p. 480.)

Such, too, is the case with this *Steno fuscus*, and it should be dropped forever from the catalogue of species.

Since the foregoing paragraphs were written, Dr. Lütken has published an important account of the genera *Steno*, *Delphinus* and *Prodelphinus*, based on the material in the Copenhagen Museum.*

He gives in plate 1 a colored figure of *S. rostratus*, constructed from data furnished by Captain Andréa. This figure does not agree closely with those of Cuvier, Van Breda or Peters, but is unquestionably much more accurate than those of the first two authors mentioned. That it represents the species called *Delphinus rostratus* by Cuvier and Desmarest is highly probable, and I have, therefore, substituted it for Cuvier's figure as an illustration in the Synopsis.

There are no grounds for considering Peters' figure of *S. perspicillatus* less accurate than the newly-published figure of *S. rostratus*. There is, however, a decided want of agreement between the two figures and the descriptions in regard to the coloration of the species. Until, therefore, it can be proven that *S. perspicillatus* is the young of *S. rostratus*, or that the coloration of the latter is exceedingly variable, it seems to me that the Peters' species must be considered distinct. The two species are quite similar in osteological characters. Their vertebral formulæ are as follows:

and rudimentary transverse process of the axis were visible behind those of the atlas. The third cervical had on each side a perpendicular flat triangular process, pierced by a large foramen. In the following three vertebræ the bony ring surrounding the foramen was incomplete. In the seventh cervical there was a tolerably long diapophysis, but no parapopysis. Thirteen pairs of ribs were present, the first of which was much the largest. The first six were attached to the vertebræ by both neck and head.

The first neural spine of the dorsal region was on the second dorsal vertebra, and, with the next following, was directed much backward. The last ten caudal vertebræ, which were located in the flukes, were without neural arches. Twenty-three chevron bones were present, the three posterior ones being rudimentary.

The longest transverse process was on the second lumbar vertebra. The last trace of a transverse process was found on the fourteenth caudal vertebra. The first perforations of the transverse processes for the passage of the caudal artery were in the sixth and seventh caudal vertebræ

Five metacarpal bones were present. The formula of the phalanges was as follows: I, 4; II, 8; III, 6; IV, 3; V, 3.

Dr. Lütken gives, in addition, the following measurements of eight skulls in the Copenhagen Museum. Two of these, Nos. 2 and 5, he regards as possibly belonging to a separate but closely allied species.

Measurements of eight skulls of Steno rostratus. (From Lütken.)

Number.	Length of skull.	Length of brain-case.	Breadth of brain-case.	Length of symphysis of mandible.
	Cm.	*Cm.*	*Cm.*	*Cm.*
2	54.0	21.3	21.3	15.5
6	53.5	22.4	22.5	15.8
1	53.0	22.0	22.6	15.0
10	53.0	21.7	23.1	15.3
9	52.0	20.9	21.0	16.3
5	51.2	19.8	19.8	16.0
3	51.0	21.8	21.8	14.5
4	50.5	21.7	22.1	13.5

One of the two skulls (Nos. 2 and 5) regarded as belonging to a separate species is from the Pacific Ocean. It was obtained by Professor Reinhardt at Honolulu, while on the *Galathea* expedition.

Measurements of twenty-five skulls of Steno rostratus and the type-skull of S. perspicillatus.

	Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—	
								At base of maxillary notches.	At its middle.
						Cm.	*Cm.*	*Cm.*	*Cm.*
a	346*a*	Brit. Mus	*S. compressus*			51.1	32.5	9.3	4.2
b	346*b*	do	do			52.1	31.8	9.9	4.1
c	345*c*	do	*S. frontatus*	India		51.1	30.0	10.7	5.2
d	345*d*	do				51.8	30.7	10.5	5.1
e	24, 2, 63	Liverpool Pub. Mus.				54.0	33.6	9.8	4.5
f	12, 7, 69, 1	do				52.3	31.1	10.5	5.2
g	23, 1, 64, 2	do				51.5	30.5	9.7	4.8
h	*a*	do				54.4	32.0	10.2	4.8
i	19, 11, 62	do				54.4	31.9	10.2	4.8
j	7, 7, 66, 31	do				53.4	31.7	9.5	3.8
k	21, 5, 62, 1	do				55.3	33.2	10.8	5.5
l	70, 2, 70, 63	do				50.8	29.2	10.2	5.5
m	24, 3, 59, 2	do				53.0	30.1	9.8	5.5

Measurements of twenty-five skulls of Steno rostratus and the type-skull of S. perspicillatus.

	Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margin of intermaxillæ proximally.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Number of teeth.
					Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.					
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
a	2.9	8.0	26.0	6.6	35.5	38.1	16.4	14.5	8.6	8.0	43.2	16.8	27.4	7.4	$\frac{25-24}{27-25}$
b	2.8	.....	.....	.....	.....	.....	.....	15.5	....	....	43.8	15.6	....	.....	$\frac{22-22}{24-24}$
c	3.6	8.0	24.2	6.3	34.3	36.5	19.3	15.0	10.7	9.1	43.2	14.2	25.4	8.6	$\frac{22-23}{22-22}$
d	3.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	43.8	15.6	.....	.....	$\frac{21-22}{22-22}$
e	3.2	.....	27.5	.....	37.6	.....	18.8	15.3	10.2	8.3	46.1	15 3	.....	.....	$\frac{25}{24}$
f	3.8	.....	26.4	.....	36.2	.....	20.3	16.0	11.2	9.5	43.8	13.3	.....	.....	$\frac{21}{21}$
g	3.2	.....	25.4	.....	34.5	.....	18.2	15.3	10.8	8.9	42.5	14.0	.....	.....	$\frac{22}{21}$
h	3.7	.....	.....	.....	.....	.....	20.0	.....	.....	.....	.....	.....	.....	.....	$\frac{23-22}{23-22}$
i	3.2	.....	.....	.....	.....	.....	19.7	.....	.....	.....	.....	.....	.....	.....	$\frac{23}{22}$
j	2.9	.....	.....	.....	.....	.....	17.8	.....	.....	.....	.....	.....	.....	.....	$\frac{24}{24}$
k	3.8	.....	.....	.....	.....	.....	19.7	.....	.....	.....	.....	.....	.....	.....	$\frac{20}{21}$
l	4.0	.....	.....	.....	.....	.....	19.7	.....	.....	.....	.....	.....	.....	.....	$\frac{23}{23}$
m	3.8	.....	.....	.....	.....	.....	20.0	.....	.....	.....	.....	.....	.....	.....	$\frac{23}{23}$
n	2.9	.....	.....	.....	.....	.....	18.8	.....	.....	.....	.....	.....	.....	.....	$\frac{23}{24}$
o	.....	.....	.....	.....	.....	.....	17.5	16.9	....	....	41.0	14.0	.....	.....	$\frac{21-21}{22-20}$
p	3.3	.....	.....	.....	.....	.....	18.8	15.0	10.3	8.9	.....	13.4	.....	.....	$\frac{22-21}{22-22}$
q	3.2	.....	.....	.....	.....	.....	16.5	13.2	9.5	8.5	.....	13.2	.....	.....	$\frac{23-23}{24-24}$
r	3.6	.....	.....	.....	.....	.....	17.8	14.6	9.5	8.8	.....	(?)14.0	.....	.....	$\frac{23-24}{25-25}$
s	.....	.....	.....	.....	.....	.....	18.2	13.5	.....	.....	.....	.....	.....	.....	$\frac{24-25}{25-25}$
t	.....	.....	.....	.....	.....	.....	16.5	15.0	.....	.....	.....	.....	.....	.....	$\frac{24-25}{25-25}$
u	.....	.....	.....	.....	.....	.....	17.5	14.2	.....	.....	.....	.....	.....	.....	$\frac{23-24}{25-24}$
v	3.8	.....	27.0	.....	.....	.....	20.0	16.0	.....	15.0	.....	.....	.....	.....	$\frac{20-21}{22-24}$
w	.....	.....	.....	.....	.....	.....	18.0	15.5	.....	.....	.....	.....	.....	.....	$\frac{21-20}{23-23}$
x	.....	.....	.....	.....	.....	.....	19.0	15.7	.....	.....	.....	.....	.....	.....	$\frac{21-21}{24-24}$
y	.....	.....	.....	.....	.....	.....	19.6	15.5	.....	.....	.....	.....	.....	.....	$\frac{20-21}{22-20}$
z	3.7	8.7	24.7	5.6	33.3	35.5	20.4	13.6	11.0	9.3	.....	.....	.....	.....	$\frac{24-23}{22-21}$

STENO PERSPICILLATUS Peters.

Delphinus (*Steno*) *perspicillatus*, Peters, Monatsber. der K. Akad. Berlin, 1876, pp. 360–366, pls. 2, 3.

The reasons for regarding this species as distinct from *S. rostratus* have been given on p. 25. It differs apparently only in external characters. Peters' specimen was a female, and was taken in the Atlantic Ocean, in 32° 29′ 7″ S. lat, 2° 1′ W. long. The measurements of the skull of this individual are, for purposes of comparison, included in the foregoing table of measurements of *S. rostratus* (p. 30).

3. TURSIOPS Gervais.

Tursiops, Gervais, Hist. nat. des Mamm., II, 1855, p. 323. (*Fide* Flower.)

This genus is distinguishable from *Prodelphinus* principally by its less numerous and larger teeth. From *Steno* it differs by reason of its short mandibular symphysis and more numerous vertebræ.

The numerous species described by Gray were founded chiefly upon single skulls, and their true relationships are, therefore, not readily to be made out. From such evidence as we possess, however, there appear to be four species, as follows: *Tursiops tursio* (Fabricius); *Tursiops catalania* (Gray); *Tursiops abusalam* (Rüppell); *Tursiops gillii* Dall.

Tursiops aduncus, Hemp. and Ehrenberg, may or may not prove to be distinct, but as we have not had access to the original description of that species, we venture no opinion regarding it.

TURSIOPS TURSIO (Fabricius).

Delphinus tursio, Fabricius, Fauna Groenland., 1780, p. 49.
Delphinus tursio, Bonnaterre, Cétologie, 1789, p. 21.
Delphinus truncatus, Montagu, Mem. Wern. Soc., III, 1821, p. 75.
Tursiops tursio, Gervais, Comp. Rend., 1864, p. 876.

collection. This series comprises about forty-five specimens, of which ten are fragmentary, and three fœtal or very young. Of four only is the sex known.

The greater part of these skulls were collected by Dr. H. C. Yarrow at Fort Macon, North Carolina; others are from the fishing grounds at Hatteras, North Carolina; and the remainder are from different points on the Atlantic coast between New Jersey and Florida. The species is perfectly well known to our fishermen. Large numbers have been taken for many years at Hatteras, where I have myself witnessed the capture of between eighty and ninety in a single day. These individuals were about equally divided between the two sexes, and were of all ages.

From the skulls above mentioned I have selected twenty-one perfect specimens of nearly equal size for comparison. Their sex is unknown, but from the fact that they were picked up at random on the beach, and that males and females frequent this coast in about equal numbers, it is highly improbable that all are males or all females. If there are differences between the sexes as regards the proportions of the length and width of the beak they should appear on comparison of the measurements.

In his valuable paper on the cetaceans of Southwestern France, Dr. Fischer calls attention to sexual differences in the skulls of *Tursiops tursio*. *His words (translated) are as follows:*

Upon examining together the heads of males and females, one perceives that they present characteristic differences. The beak is longer and relatively narrow in the males. * * * The heads of the females are remarkable on account of the breadth of the beak at its base and at the middle; the beak has consequently a more triangular form.

The measurements given by Dr. Fischer do not entirely bear out these statements. From these the following results are obtained:

Comparison.	♂ 1 compared with ♀ 6 (adulte).	♂ 3 compared with ♀ 4 (épiphysée).	♂ 3 compared with ♀ 11 (épiphysée).	♂ 7 compared with ♀ 5 (jeune).
Relative length of beak of male compared with that of female	Longer.	Shorter.	Shorter.	Longer.
Width of beak at base in male compared with ditto in female	Narrower.	Narrower.	Narrower.	Wider.
Width of beak at middle in male compared with ditto in female	Narrower.	Narrower.	Narrower.	Wider.

It appears from these comparisons that ♂ 1 has a longer and narrower beak than ♀ 6; ♂ 3 has a *shorter* and narrower beak than ♀ 4 ♀ 11; and ♂ 7 has a longer and *wider* beak than ♀ 5. Thus we have three of the four possible combinations—long and narrow, long and wide, short and narrow—in the same sex.

*Actes de la Soc. Linn. de Bordeaux, 4me sér., v, 1881, p. 159.

The four skulls of known sex in the national collection have the following absolute proportions:

Measurements of four skulls of T. tursio.

Measurements.	20901 (Fire Island, N. Y.).	16504 (Cherrystone Point, Va.).	20962 (Turkey Gut, N. Y.).	22304 (off Hatteras, N. C.).
Total length	43.3	43.9	44.0	52.9
Length of beak	22.4	24.1	24.4	28.9
Breadth of beak at notches	11.2	10.1	10.3	12.6
Breadth of beak at middle	7.0	6.9	6.4	8.0
Breadth of intermaxillæ at middle	3.7	3.2	3.3	4.4
Depth of beak at middle	.....	2.7	.....	2.8
Length of tooth-line	19.4	20.4	21.1	24.8
Breadth across orbital processes of frontal	20.0	20.4	19.3	24.7
Length of mandible	36.2	37.5	37.6	45.0
Depth at coronoid	8.1	8.4	7.9	9.4
Teeth	24-25	24-24	23-23	26-25
	24-24	23-23	23-25	24-24
Age	Young.	Young.	Young.	Old.
Sex	♂	♂	♀	♀
Condition	Fresh.	Fresh.	Fresh.	Fresh.

From these measurements we select the following for comparison:

Measurements.	20901, ♂ *a*, Fire Island, N. Y. (young).	16504, ♂ *b*, Cherrystone Point, Va. (young).	20962, ♀ *c*, Turkey Gut, N. Y. (young).	22304, ♀ *d*, Hatteras, N. C. (old).
	Cm.	*Cm.*	*Cm.*	*Cm.*
Total length	43.3	43.9	44.0	52.9
Length of beak	22.4	24.1	24.4	28.9
Breadth of beak at maxillary notches	11.2	10.1	10.3	12.6
Breadth of beak at middle	7.0	6.9	6.4	8.0

versa; in others short and narrow, and the opposite. The table of measurements is as follows, the skulls being arranged in order of their absolute length:

Measurements of twenty-one skulls of Tursiops tursio.

[Measurements in centimeters.]

Number.	Total length.	Length of beak.	Breadth of beak at notches.	Breadth of beak at middle.	Breadth of intermaxillæ same point.	Depth of beak at middle (including intermaxillæ).	Length of tooth-line.	Breadth between orbital processes of frontal.	Total length of mandible.	Depth between angle and coronoid process.	Teeth.	Remarks.
12277 (N. C.)	43.2	23.2	10.8	7.0	3.8	2.7	19.5	19.1	36.5	8.2	23—23 / 24—23	Sutures distinct; teeth sharp; fresh.
11997 (N. C.)	43.3	22.9	10.8	6.8	3.4	2.6	19.5	20.3	.....	.....	.....	Sutures open; beach-worn.
12005 (N. C.)	44.2	23.6	12.0	7.9	4.7	3.2	20.0	21.8	.....	.....	23?—23	Sutures distinct; beach-worn.
12007 (N. C.)	44.3	24.1	10.8	6.4	3.6	....	20.5	.....	.....	.....	.....	Young; beach-worn.
12275 (N. C.)	44.8	24.6	10.3	6.3	3.4	2.6	20.9	20.9	38.0	8.2	24—24 / 23—24	Sutures distinct; teeth sharp; fresh.
20767 (Point Lookout, Md.)	45.2	24.8	11.4	6.9	3.8	....	21.3	20.9	38.4	8.5	24—23 / 24—24	Sutures distinct; teeth sharp; fresh.
11998 (N. C.)	45.6	24.2	12.4	7.9	4.2	3.1	20.8	22.6	....	....	22—23	Sutures open; beach-worn.
12011 (N. C.)	45.6	24.7	11.4	7.4	4.7	2.9	20.7	20.6	.....	....	23—22	Sutures distinct; unknown; beach-worn.
12009 (N. C.)	45.6	24.6	12.1	7.9	4.0	2.9	21.5	21.9	....	....	26—25	Do.
12013 (N. C.)	46.2	25.1	11.2	7.6	3.9	3.0	21.6	20.3	.....	....	24—24	Sutures open; beach-worn.
12006 (N. C.)	46.3	24.7	11.8	7.6	4.1	3.1	21.2	22.1	....	....	25—24	Do.
11994 (N. C.)	46.3	24.7	12.1	7.5	4.2	3.0	21.2	21.9	.....	.....	.....	Do.
12002 (N. C.)	46.4	24.7	11.7	8.0	4.2	2.9	20.3	21.8	....	....	22—22	Do.
11995 (N. C.)	46.4	24.7	11.5	7.2	4.2	3.0	21.2	22.8	....	....	24—24	Do.
12004 (N. C.)	46.6	25.4	11.8	7.5	4.0	2.9	21.4	21.3	.....	....	24—23	Do.
11993 (N. C.)	46.7	25.7	11.1	7.1	3.8	2.8	21.9	20.4	.....	.....	22 24	Do.
12001 (N. C.)	46.8	24.8	12.2	7.5	4.1	3.1	21.7	22.1	.....	....	23 23	Do.
12274 (N. C.)	47.0	25.5	11.6	7.3	4.2	2.9	21.2	22.3	39.7	8.6	24—24 / 24—24	Sutures distinct; teeth sharp; fresh.
12276 (N. C.)	47.1	25.5	11.1	7.0	3.9	2.7	21.8	20.7	39.0	8.3	25—25 / 24—24	Do.
12014 (N. C.)	47.3	25.8	11.9	7.3	4.2	3.2	21.9	21.5	.....	....	26—26	Sutures open; beach-worn.
22080 (Hatteras)	47.8	27.0	11.2	6.7	3.5	2.9	23.2	20.9	.....	....	23—25	Sutures open; fresh.

The skulls, it will be observed, vary but little in length; they rise by gradations of 6mm and less from 43.2 to 47.8cm.

We shall first examine the table for indications of differences in the relative length of the beak as co

the skull. The proportional length of the beak in the different specimens, arranged in an ascending scale, is as follows:

52.9 per cent.	53.4 per cent.	54.4 per cent.
53.0	53.7	54.5
53.1	53.9	54.5
53.2	54.1	54.9
53.2	54.2	55.0
53.4	54.3	55.4
53.4	54.3	56.5

It appears that, excepting in the skull with relatively longest beak, the proportion of the length of the beak rises by gradations of four-tenths of 1 per cent. and less.

The proportion of the width of the beak at its base to its length is as follows:

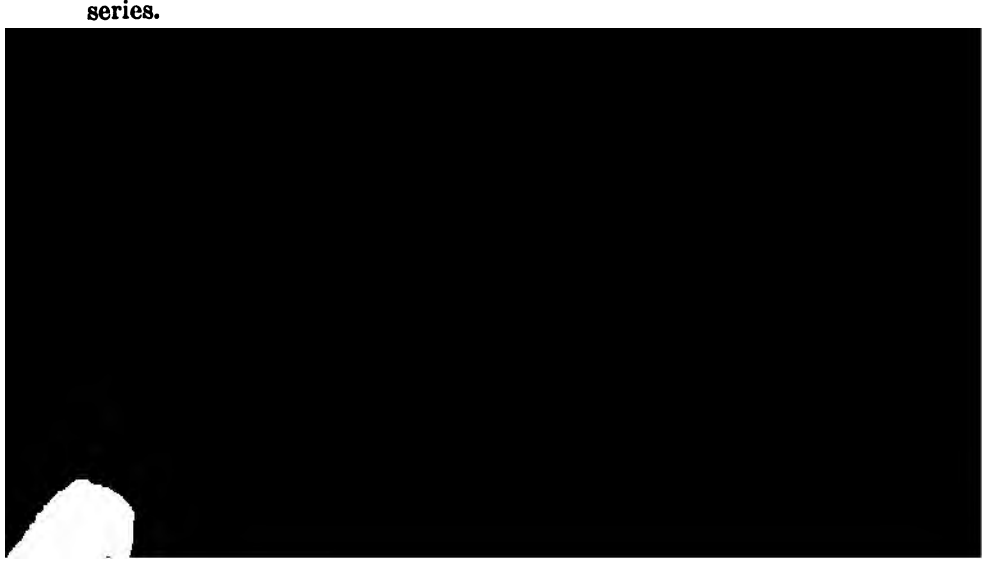
41.5 per cent.	46.0 per cent.	47.4 per cent.
41.9	46.1	47.8
43.1	46.1	49.0
43.5	46.4	49.2
44.6	46.6	49.2
44.8	46.6	50.9
45.5	47.1	51.2

The gradations here are 1.7 per cent., 1.1 per cent., and less.

The proportions of the width of the beak at its middle compared with its length rise by gradations of 1 per cent. and less, as follows:

24.8 per cent.	28.6 per cent.	30.3 per cent.
25.6	29.1	30.4
26.5	29.5	30.8
27.5	29.7	32.1
27.6	30.0	32.4
27.8	30.2	32.6
28.3	30.2	33.5

In all three cases the greatest variation is at the extremes of the series.



Dr. Fischer's Nos. 8 and 9, of unknown sex, but which from a consideration of the proportions he believes to be females, should, I think, be regarded as males if the length of the mandible alone is considered, but, on the contrary, as females if the breadth of the beak is considered.

From the facts presented, and numerous others, I am inclined to regard the variation in cranial proportions as of little value in determining the sex. From Dr. Fischer's material and that to which I have had access, however, we are able to get some idea of the limits of variation in cranial proportions. The greatest and least proportions, as regards the length of the beak in thirty-five specimens, are as follows:

Proportion of length of beak to total length of skull:
Greatest.....58.2 per cent. (Dr. Fischer, No. 1, ♂ très adulte).
Least.....52.9 per cent. (11997, Fort Macon, young).
[Note.....48.7 per cent. in fœtus, 24300, Hatteras.]

Proportion of width of beak at base to its length:
Greatest.....51.9 per cent. (Dr. Fischer, No. 4, ♀, épiph.).
Least.....41.5 per cent. (22080, Hatteras, not old).
[Note.....48.7 per cent. in fœtus, 24300, Hatteras.]

Proportion of width of beak at middle to its length:
Greatest.....26.7 per cent. (Dr. Fischer, No. 11, ♀, épiph.).
Least.....24.8 per cent. (22080, Hatteras).
[Note.....31.6 per cent. in fœtus, 24300, Hatteras.]

The skull absolutely longest of this series is Dr. Fischer's No. 1, a male "très adulte," 55^{cm}; my largest specimen is No. 22304, old female, 52.9^{cm}.

Tursio eurynome Gray.

I pass now to the consideration of the species identical with or allied to *T. tursio*. The first of these is *T. eurynome*, Gray, founded on a single skull, No. 356*a*, in the British Museum. The chief characters which Gray gives are cranial proportions. Regarding its relationships he says:

> The skull of this species is most like *D. tursio;* but the nose is one-fourth longer than the length of the head, slenderer and more rounded, and the teeth smaller.*

In the diagnosis of *D. tursio*, however, he has: "Skull-nose five-ninths the entire length." On comparing his measurements of *T. eurynome*, it appears that this proportion exists here also. In relative breadth the beak exceeds several of the North Carolina skulls, notably No. 22304, ♀, from Hatteras, which is only 3^{mm} larger. It agrees very closely in absolute size of parts with Dr. Fischer's ♂ No. 1. In none of its relative proportions does it fall outside the limits of variation of the series discussed on page 35. Speaking of this skull and others in the series, Gray himself says: "These are all very much alike."† Professor Flower includes it in his "section" *T. tursio*, with others, saying that

*Cat. Seals and Whales, p. 261
†Suppl. Cat. Seals and Whales, p. 75.

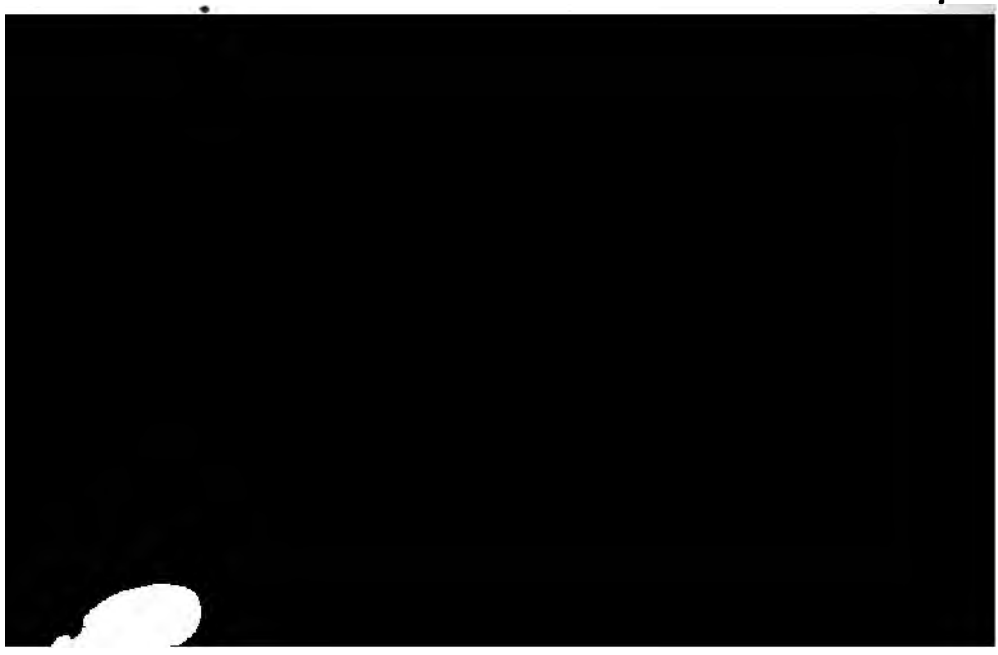
some of them "may be specifically distinct."* With this skull, the type of *T. metis*, and the skulls called *T. truncatus* in the British Museum before me, I wrote in my note-book, "It is doubtful if any distinction is to be made between these."

For my own part I have no hesitancy in making *T. eurynome* a synonym of *T. tursio*. The species is founded on a single skull, and its characters are drawn from proportions. It has been shown that neither in absolute size nor in proportions does it lie outside the limits of variation of *T. tursio*. It should be borne in mind that in cases of this kind we can never hope to acquire specimens agreeing *exactly* with the type. Among a thousand skulls of the same species it is doubtful if any two absolutely alike could be found.

Tursio metis Gray.

The second of Gray's species to be considered is his *Tursio metis*. Gray states that the skull "differs from *Delphinus Tursio's* in the nose being much shorter and more conical and acute."† As a matter of fact, the beak is relatively longer than the skull of *T. tursio* from Montagu's collection in the British Museum (353*a*), which Gray includes in the latter species in the Catalogue. That the beak is more acute than in many specimens of *T. tursio* is true; but it is less acute than in No. 22080 of that species from Hatteras, which was picked up on the beach with others by myself. Comparing it with the latter, I find that the beak is a trifle shorter, but somewhat wider both at the base and at the middle, and that the intermaxillæ are also wider. I cannot but regard it as a narrow-beaked specimen of *T. tursio*.

Tursio cymodice Gray.



It is interesting, however, to know that it is in all probability simply a young specimen of *T. tursio.*

In the following table are brought together measurements of the type skulls of *T. metis*, *eurynome*, and *cymodice*, and of some other skulls in the British Museum, labeled *tursio*, *metis*, etc.:

Table of measurements.

TURSIOPS TURSIO.

Catalogue number.	Collection.	Type of–	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ, proximally.
							At base of maxillary notches.	At its middle.		
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
356*a*	Brit. Mus.	*T. eurynome* ..	North Sea ?.....	....	52.6	30.5	13.5	8.5	4.5	9.9
357	...do	*T. metis*.....	.....	....	52.1	29.3	13.0	7.3	4.3	9.1
355*a*	...do	*T. cymodice* ...	....	Jr.	45.7	24.9	11.5	6.7	4.0	9.1
353*a*	...do	.....	.....	....	54.6	30.5	14.5	10.2	5.6	10.9
353*g*	...do	.....	Frith of Forth..	....	57.8	32.0	15.8	9.7	5.7	11.2
353*h*	...do	.....	.....	....	49.3	27.3	13.2	8.7	4.5	9.9
357*b*	...do	.....	Herne Bay.....	....	55.1	31.4	13.7	8.5	4.6	10.2

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.					
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
356*a*	25.6	5.8	35.6	38.6	23.0	.....	10.6	7.8	45.6	6.2	24.6	9.5	25—25 23—23
357	25.4	4.8	35.6	36.0	21.3	16.4	11.7	8.3	44.2	6.7	24.5	9.8	23—23 22—22
355*a*	20.8	5.2	28.9	31.1	19.8	16.4	9.9	7.2	38.1	6.2	20.8	8	24—23 21—21
353*a*	25.8	5.6	35.7	38.5	25.4	15.0	12.7	9.4	.....	.....	.....	.....	21—20 ?— ?
353*g*	26 7	6.0	39.4	41.7	28.0	16.9	13.2	8.5	50.8	8.0	26.7	10.9	21—20 21—21
353*h*	23.4	5.3	31.5	33.7	23 1	17.5	10.9	7.5	41.9	6.1	22.6	9.4	21—26 20—20
357*b*	26.2	6.6	37.3	.....	23.9	16.8	11.1	7.9	46.7	6.7	26.2	9.7	24—24 23—24

I have observed it, is always clear plumbeous gray above. The color of dead specimens is very dark, but I have never observed a greenish tinge in the coloration. The types of *T. catalania* were lead-colored. We might divide, therefore, the three species by their coloration as follows:

1. Upper parts lead-colored.
   a. Belly spotted ..... *T. catalania.*
   b. Belly unspotted ..... *T. tursio.*
2. Upper parts dark sea green.
   Belly spotted ..... *T. abusalam.*

The proportions of the body are much alike in *T. catalania* and *T. abusalam*, as will be seen from the following comparative table:

Measurements.	T. catalania (from Macgillevray, reduced to meters), ♀.	T. abusalam (from Rüppell, reduced to meters), ♀ adult.
Total length	2.058	1.949
Tip of snout to eye	0.305	0.297
Tip of snout to anterior base of dorsal fin	0.915	0.893
Height of dorsal fin (vertical)	0.203	0.216
Distance between the extremities of the flukes	0.559	0.514

The skeleton of *T. catalania* is unknown; for *T. abusalam* Rüppell gives the following vertebral formula: C., 7; D., 12; L., 16; Ca., 26=61.

In two of the skeletons of *T. tursio* in the national collection, however, but twelve pairs of ribs are present, and in one of these, which appears to be perfect, the total number of vertebræ is but sixty-one. We can, therefore, make no separation on the basis of the total number of vertebræ.

From such indications as we possess, this species appears to be intermediate between *T. tursio* and *T. catalania*, but most closely allied with the latter. It would not be a matter of surprise if it should prove to be identical with *T. catalania.*

TURSIOPS PARVIMANUS Lütken.

Tursiops parvimanus Lütken, K. Danske Vidensk. Selsk Skr., 6th Raekke, IV, 1887, p. 354.

Dr. Lütken has described under this name a small form, which is closely allied to *T. tursio.*

It differs chiefly in having the *third digit longer than the second, with more numerous phalanges.* The formula of the phalanges is 2, 6, 8, 3, 1. The vertebral formula is as follows: C., 7; D., 13; L., 15; Ca., 27=62. In color the species is blackish on the back and fins, and grayish-white on the belly.

The species is founded on a single young individual from the Adriatic. A diagnosis is given in the second part of this work.

TURSIOPS GILLII Dall.

Tursiops gillii, Dall, Proc. Cal. Acad. Sci., V, 1873, p. 13; Scammon, Marine Mammalia, 1874, p. 288.

This species was founded by Mr. Dall upon a single mandible, No. 13022, from Monterey, Cal.,* collected by Capt. C. M. Scammon. It belonged apparently to an adolescent individual. Although the mandible, as a rule, possesses no characters which will serve for the distinction of closely allied species, there is one in this case which seems of value, namely, the comparative size of the condyles. In this mandible the greatest diameter of the condyle is contained twice only in the greatest depth of the ramus. In all the mandibles of *T. tursio,* on the contrary, the greatest diameter of the condyle is contained two and a half times in the greatest depth of the ramus. The comparatively large condyles of *T. gillii* are found again in a skull of *Tursiops,* 54^{cm} long, from Lower California, No. 12054, collected by Captain Scammon. This skull belonged to an aged individual; the sutures are largely obliterated and the teeth are much worn.

From its proportions alone this skull could scarcely be distinguished from one of *T. tursio,* but the relations of the bones on the under surfaces are decidedly different. In *T. tursio* the optic canal rises gradually to the level of the antero-internal border of the frontal, and the whole inferior surface of the frontal is nearly plane. In *T. gillii* the optic canal ends abruptly without reaching the level of the prominent rounded antero-internal border of the frontal, which latter bone is deeply concave.

In the wall of the temporal fossa of *T. gillii* the lower part of the parietal appears as a narrow band between the anterior margin of the

* Although this specimen is not marked "type" there can be no doubt but that it is the one from which the species was described. Mr. Dall, who kindly examined the mandible at my request, could not decide whether it was his type or not, fourteen years having passed since he last saw it. It corresponds, however, absolutely to his measurements, and is furthermore, the only separate mandible of a *Tursiops* from California in the collection.

squamosal and the posterior margin of a backward extension of the frontal, while in *T. tursio* the frontal has no backward extension and the parietal is broad inferiorly. Numerous other differences are present, which, with those mentioned, I have not found in any of the variations of *T. tursio.*

Of the external appearance of this dolphin we know but little. Scammon, from two "momentary observations," describes it "as black all over, lightened a little below." His outline resembles that of a *T. tursio*, except that the dorsal fin is narrower than is common in that species.

Table of measurements.

TURSIOPS GILLII.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
							At base of maxillary notches.	At its middle.		
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
13022	U. S. Nat. Mus...	*T. gillii* .	Monterey, Cal.....	....	.....	.....	.....	.....	.....	.....
12054	...do	.....	Lower California..	Ad.	54.0	29.8	14.1	8.8	4.6	10.0
a3060	Mus. d'Hist. Nat .	.....	Monterey, Cal.....	....	50.8	27.7	13.7	7.9	4.3	9.2

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Transverse diameter of largest tooth.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						

in the present state of our knowledge it is distinguishable from *Prodelphinus*, its nearest ally, and it would even appear that *D. roseiventris*, Wagner, in some degree annuls the value of this distinction, since the grooves of its palate are shallow, though the pterygoids are very narrow, as in *D. delphis*.

DELPHINUS DELPHIS Linné.

Delphinus delphis, Linné, Syst. Nat., 10th ed., 1758, p. 77.
Delphinus major, Gray, Cat. Seals and Whales, 1866, p. 396.
Delphinus fulvofasciatus, Wagner, Schreber's Säugeth., pl. 361, fig. 1; Hombron and Jacquinot, Zool. Voyage de l'Astrolabe et Zélée, III, 1853, p. 37, Atlas, pl. 21, fig. 1, pl. 23, figs. 1, 2.
D. Forsteri, Gray, Cat. Seals and Whales, 1866, p. 248; Synopsis, 1868, p. 8.
Delphinus janira, Gray, Zool. Erebus and Terror, 1846, p. 41, pl. 23; Catalogue, 1st ed., 1850, p. 123; 2d ed., 1866, pp. 245, 398; Supplement, 1868, p. 68.
Delphinus pomecgra, Owen, Trans. Zool. Soc. London, VI, 1869, p. 23.
Delphinus Bairdii, Dall, Proc. California Acad. Sci., V, 1873, p. 12; Scammon's Mar. Mamm., 1874, p. 283.
Delphinus Moorei, Gray, Catalogue, 1866, p. 396; Supplement, p. 68.
Delphinus Walkeri, Gray, Catalogue, 1866, p. 397; Supplement, p. 68.
† *Delphinus novæ-zealandiæ*, Quoy & Gaimard, Voyage de l'Astrolobe, Mamm., 1830, p. 149.
Delphinus albimanus, Peale, U. S. Explor. Exped., 1st ed., VIII, 1848, Mamm. and Ornith., 1848, p. 33; Cassin, ditto, 2d ed., 1858, p. 29, pl. 6, fig. 1.
Delphinus marginatus, Lafont, Actes d. l. Soc. Linn. de Bordeaux, 3d ser., VI, p. 518.
D. fusus, souverbianus, variegatus, balteatus, moschatus, Lafont, Fischer, Actes d. l. Soc. Linn. de Bordeaux, 4th ser., V, 1881, p. 127.

The elaborate discussion of this species by Fischer (op. cit.) leaves little to be said until great accumulations of new material have been made. I shall confine myself, therefore, to the consideration of his conclusions in the light of such material as I have at command. From the examination of fresh specimens and skulls, I am convinced that the common *Delphinus* of the Atlantic coast of North America is, as it has generally been considered to be, identical with Linné's *Delphinus delphis*. I have little hesitancy, therefore, in testing the conclusions based upon European specimens by specimens from American waters.

As regards the color of this species, I am convinced of the wisdom of Professor Fischer's remarks: "On ne saurait établir des espèces d'après des caratères aussi instables." There are in my charge drawings of four specimens taken at different times on our Atlantic coast, and a photograph of a fifth. No two of these agree *exactly* with one another nor with any of Lafont's species.

Drawing No. 1 represents an individual similar to that represented by Professor Fischer (Pl. IV, Fig. 1), under the name of *D. delphis*, var. *fusus*. It differs, however, in having no white area on the side below the dorsal fin. An area over the anus is yellowish, like the anterior portion of the side. The long narrow streaks of color on the sides are gray rather than greenish or black. The sex of this specimen and the next is unfortunately unrecorded.

Drawing No. 2 is similar to the last, but the yellow color of the anterior portion of the side is dull and grayish. The light area back of the dorsal fin is white, as in Professor Fischer's figure of *fusus*. A black band starts from the lower side of the tail, as in Professor Fischer's figure of *souverbianus*, but reaches the line of the anterior base of the dorsal fin. The lateral lines are light gray.

Drawings Nos. 3 and 4 represent, respectively, a female and male taken at the same time.

The female resembles Fischer's figure of *moschatus* (Pl. v, Fig. 1), but the lower jaw is dark-greenish gray, which color extends to and includes the pectoral. The pinkish white of the belly does not extend back of the anus nor above the level of the pectoral fin. All the upper portion of the side is of a nearly uniform dark gray traversed by a narrow band of lighter gray.

The male is like the female, except that the lower half of the body, from about the base of the pectoral fin to and beyond the anus, is of a uniform light gray.

The photograph represents one female like *fusus*, but with a light band at the base of the beak like that in *variegatus*.

Another specimen which I examined had a large area in the center of the dorsal fin nearly pure white.

From these five specimens we would be compelled, following Lafont's opinions, to describe three additional species. Such a course appears to me far from advisable. I am strongly of the opinion that these differences of color are to be looked upon as individual variations. The fact that we do not assign them distinct specific names does not imply that we look upon such variations as void of interest.

I shall next consider the cranial characters and proportions of the species.

M. Fischer states that the male has a longer and narrower beak than the female. His tables give the following proportions:

We learn from this table that, in a general way, the beak is proportionally longest in the largest, most nearly adult, skull; also that the proportion of the width of the beak to its length is not co-ordinated with the absolute size of the skull. The longest beaks are not always the narrowest.

The shortest beak in this series of females is in length 54.7 per cent. of the total; the longest, 61.1 per cent. The widest beak has a breadth equaling 22.5 per cent. of its length, and the narrowest 17.3 per cent. The average length of the beaks for the three largest skulls is 60.5 per cent.; for the whole series, 58.3. The average width of the three largest is 19.3 per cent.; for the whole series, 20.1.

M. Fischer gives measurements of only two males. The proportions of the beak in these and one additional male in the national collection are shown in the following table:

Description.	Total length of skull.	Per cent. of length of beak to total length.	Per cent. of width of beak at its middle to its length.
	Cm.		
Delphinus delphis, "fusus D" (Fischer)	46.3	59.4	18.1
"fusus" 411/ (U. S. N. M.)..	48.0	62.5	20.1
"fusus A" (Fischer)	49.8	61.3	16.6

In these three specimens again we find that there is no correlation between the width of the beak and the absolute size.

The length of the longest beak is 62.5 per cent. of the total, or a little more than that of the longest-beaked female. The average proportional length of the beak is also a little more than in the three largest females, viz, 61.1 per cent. The widest beak has a breadth equaling 20.1 per cent. of its absolute length, and the narrowest 16.6 per cent. The latter proportion is considerably less than in the females, while the average, 18.3 per cent., is also less.

M. Fischer's generalization is borne out by these percentages, but it should be remembered that two of the three males here considered are absolutely larger than any of the females. Since the percentage of the length of the beak rises with the absolute size of the skulls, if the females reach the same size as the males, it appears to me probable that males and females of the same absolute size would give the same percentages of length of beak. This opinion receives some support from the fact that M. Fischer's male "*fusus* D," which is absolutely larger than any of the females except "*fusus* B," has a relatively shorter beak than three of the females.

In addition to the individuals already discussed, I have myself measured a considerable number of similar skulls in the Muséum d'Histoire Naturelle, the British Museum, and elsewhere. In many cases the localities are not given.

In the following table all these specimens are brought together for comparison:

Reference number.	Catalogue number.	Collection.	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak at base of notches.	Breadth of beak at its middle.	Breadth of internasillæ at same point.	Greatest breadth between outer margins of intermaxillæ proximally.
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
1	*a*3079	Paris Mus		Young	37.4	22.1	8.4	4.6	.....	.....
2	15781	U. S. Nat. Mus	New York Bay	do	41.2	25.3	8.2	4.9	2.2	7.1
3	3885	do	Unknown	.....	42.0	25.2	8.5	5.2	2.1	7.0
4	7063	do	New York Harbor	.....	43.3	26.6	9.0	4.5	2.3	7.1
5	*a*3073	Paris Mus	Unknown	Adult.	43.8	27.4	9.2	5.1	.....	.....
6	*a*3072	do	Coast of Hérault	do	44.5	27.4	8.9	5.1	.....	.....
7	*a*3075	do	Unknown	do	44.5	27.2	9.2	5.6	.....	.....
8	*a*3077	do	Coast of Algeria, 1874.	do	44.5	27.2	8.9	5.1	.....	.....
9	*a*3088	do	Coast of Algeria	do	45.0	28.2	8.6	4.8	.....	.....
10	*a*3074	do	Unknown	do	45.5	28.0	9.4	5.6	.....	.....
11	348*f* "b".	British Mus		.....	45.7	28.2	9.1	5.3	2.3	8.0
		Liverpool Pub. Mus.	do	Old	46.4	29.0	10.2	5.7	2.9	.....
12	20873	U. S. Nat. Mus	Off Block I'd, R.I.	Adult.	46.7	28.2	9.3	5.3	2.3	7.4
13	574*b*	Cambridge Zool. Mus.	Sydney Museum	.....	46.7	29.5	10.0	5.2	2.2	7.0
14	*a*3081	Paris Mus	Unknown	Adult.	46.8	28.7	9.9	6.1	.....	.....
15	574*a*	Cambridge Zool. Mus.	Bahama Islands	.....	47.4	29.2	10.2	5.6	2.4	7.6

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak at—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.		Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
*a*3079	.....	.....	.....	.....	15.5	.....	.....	.....	.....	.....	.....	.....	.....	.....
														{ 3.49

Delphinus major Gray.

Among the skulls resembling *D. delphis* in the various European museums are some which have been made the types of distinct species. Among these species are *D. longirostris*, *major*, *fulvofasciatus*, *Moorei*, *Walkeri*, *janira*, and *Forsteri*. It now becomes our duty to consider these specimens, in order to determine whether they are to be regarded as identical with *D. delphis* or as distinct.

I will first take up *Delphinus major* Gray (Cat. Seals and Whales, 1866, p. 396).

Gray's first character is: "Skull larger than that of *D. delphis*." The total length, according to my measurements, is 52.7^{cm}. This exceeds by 6^{cm} Fischer's largest specimen of *D. delphis* (*D. d. fusus* A.). Another character lies in the length of the beak, which exceeds three times the width of the beak at the base. This relation holds true of five of M. Fischer's eleven females of *D. delphis* and of one of the two males. The depth and width of the palatal grooves is a third character in Gray's diagnosis. Regarding this character I can only say that my observation teaches me that the grooves vary more or less in depth and width in different specimens of *D. delphis*, and that I cannot, therefore, consider this variation as of special importance.

I compared the type-skull (No. 1472*a*, Brit. Mus.) in the British Museum with skulls of *D. delphis*, and have since compared the photograph of the same, which I was permitted to have made, with skulls in the National Museum. As a result, I cannot find character which seem to me of importance as distinguishing this skull from those of *D. delphis*. The mandible is rather narrower than is common in *D. delphis*, and the alveolar border is less concave, but these are details which are not of prime importance.

As regards proportions, the skull of *D. major* has a relatively longer and narrower beak and narrower brain-case than the majority of *D. delphis* which I have examined. It is, however, approached very closely by the much smaller skull, No. *a*3088, Mus. d'Hist. nat., from the coast of Algeria (see Table, p. 48, No. 9). The proportions in the two skulls are as follows:

Proportions.	*D. delphis*, No. *a*3088, Paris.	*D. major*, No. 1472*a*, type, Brit. Mus.
	Cm.	*Cm.*
Total length	45.0	52.7
	Per cent.	*Per cent.*
Proportion of length of beak to total length	62.7	63.8
Proportion of width of beak at middle to its length	17.0	16.6
Proportion of width at orbits to total length, minus length of beak	95.2	90.8

There is plainly considerable difference even here, but the approximation is such that in default of finding good characters for *D. major*, I am unable to regard it other than as a large individual of *D. delphis*.

Skull No. 1625a, in the collection of the British Museum.

Among the skulls differing from the ordinary *D. delphis* in some respects is one in the British Museum, No. 1625*a*, labeled *D. longirostris*. In this skull the pterygoids are somewhat broader at the free extremity than is usual, and the breadth at the orbits is considerably less. This skull is 47^{cm} long, while the breadth at the orbits is but 14^{cm}. No. 574*a*, in the Cambridge Museum from the Bahamas (see Table, p. 48, No. 15), which is one of the skulls having the least width at the orbits, measures 17.6^{cm} at this point, though but 47.4^{cm} in total length. I am unable, however, to discover any other characters by which to separate it from *D. delphis*, and regard it inadvisable, therefore, to remove it from that species.

Delphinus fulvofasciatus Hombron and Jacquinot.

The type of *D. fulvofasciatus*, Hombron and Jacquinot, No. *a*3025, in the Paris Museum, from Hobart Town, Tasmania, differs from the *average D. delphis*, so far as I was able to determine, only in being somewhat broader across the orbits, as is also the case with No. *a*3071 in the same museum from Tasmania, and labeled *D. tasmaniensis*. The length of these skulls and the width at the orbits are compared in the following table with the same measurements of a skull also in the Paris Museum, from Algeria, and with No. 20873 in the U. S. National Museum, from Block Island:

Number.	Collection.	Locality.	Type of—	Total length.	Width at orbits.
				Cm.	*Cm.*

(Pl. XXI, Fig. 1), closely resembles drawing No. 1 in the national collection, described on p. 45, but with the following differences: The color of the light area of the sides in *fulvofasciatus* is pinkish, rather than yellow, and there is no appearance of the crossing of color below the dorsal fin, which is commonly characteristic of *D. delphis*. The white of the belly extends to the flukes, which is not a common disposition in *D. delphis;* it is represented, however, in our drawing No. 2 (see p. 46). Finally, the gray mark at the base of the pectoral extends to the angle of the mouth, rather than to the extremity of the mandible.

Measurements applied to the figure agree very closely with M. Fischer's measurements of *D. delphis* and of specimens of the same in the National Museum. The measurements given in the text* do not agree at all with the figure and are evidently from the dry skin, as would appear from the following remarks:† "*Ce dauphin a malheureusement perdu par la dessiccation et le montage quelques-uns de ses caractères.*"

I do not think that the differences pointed out are sufficient to warrant the separation of *fulvofasciatus* from *delphis*.

To the original description of *D. novæ-zealandiæ*, which Jacquinot and Pucheran regarded as probably the same as their *D. fulvofasciatus*, I have not had access.

D. Forsteri Gray.

Delphinus Forsteri, Gray, is founded upon a drawing made by the younger Forster. Forster's description of the individual from which this drawing was made is mostly taken up with generic and supergeneric characters.‡

The colors are described as follows:

> Color supra virenti-fuscus s. ferreus, subtus albus. Macula exolete alba discum pinnarum dorsalis et pectoralium occupat, fascia alba trans rostrum.

Gray translates Forster's description (Cat. Seals and Whales, p. 248) and in the *Synopsis* (pl. 24) reproduces the drawing. The drawing does not agree exactly with the original description, the "fascia alba trans rostrum," for example, being replaced by a black band. The manner in which the fins and flukes are depicted would lead one to believe that the figure was from a specimen which had been dead for some time. The eye is entirely too large. The indications of color-markings are very unsatisfactory. I do not think that the figure is sufficiently accurate to merit serious consideration, but it may, perhaps, be pronounced an imperfect figure of *D. delphis*.

The "virenti-fuscus" of the back we find again in M. Fischer's figures, Pl. IV, fig. 1, and Pl. V, fig. 2.

As I have already stated, one of the specimens of *D. delphis* in the

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* Voyage au Pôle sud, Zoologie, III, 1853, p. 38.

† L. c., p. 37.

‡ Forster, Descriptionis animalium, etc., 1844, p. 280.

national collection, received from the U. S. Fish Commission, had a large white area on the dorsal fin, and the presence of "a small white spot on the disk of the dorsal and pectoral fin"* in *D. Forsteri* would, therefore, appear to have no special significance.

Delphinus janira Gray.

Another species which appears to be identical with *D. delphis* is *D. janira* of Gray. The type of this species, which is in the Bristol Institute, I did not have an opportunity to examine. I did, however, measure a skull in the British Museum, No. 1470*a*, which Gray labeled *D. janira*, and which agrees in every particular with the figure of the type in the Zoology of the *Erebus* and *Terror*, except that the beak is a little narrower and the opening between the intermaxillæ proximally runs back further and does not end so abruptly. This skull, which is 43.2^{cm} long, agrees very closely with No. 7063 in the National Museum, from New York Harbor (see table *infra*). Both seem to represent rather small and narrow-beaked individuals of *D. delphis*. Skulls Nos. 1470*b* and 1470*c* in the British Museum, the latter from Jamaica, and both labeled *D. janira*, are defective, but do not seem to differ from the two skulls just considered. These three skulls are rather small for their apparently mature age, but I see no reason why they should be regarded as other than small individuals of *D. delphis*. From these skulls we might be led to suppose that there was a small race of *D. delphis* peculiar to the West Indies, but the value of this supposition is lessened by the fact that the type-skull of *D. pomeegra*, Owen, the next species to be considered, which is like them in every particular, is from India.

Delphinus pomeegra Owen.

This skull, No. 1478*a*, in the British Museum, is quite defective. I was unable to find any characters by which it could be distinguished from the preceding. In the table on p. 56 are included measurements

Arguello where the original specimens were obtained. The second skull (No. 22305) was obtained by Mr. Charles H. Townsend at Monterey. Both these skulls are defective; the smaller is young, while the larger is quite old. In so far as they present characters for comparison I find nothing by which to distinguish them from skulls of *D. delphis* from the Atlantic coast.

Mr. Dall was unfortunately unable to compare his skeleton with that of *D. delphis*, to which species *D. Bairdii*, if distinct, is undoubtedly most closely allied. We have, however, for comparison, the measurements of the exterior of the original specimens, given by Scammon (Marine Mamm., p. 100). I place such of these as are comparable by the side of measurements of *D. delphis* from the Atlantic coast. The conformity of the two series of measurements is certainly remarkable, and the lack of agreement is apparently not more than would be found to exist between four individuals of the same species.

Measurements.	*D. Bairdii* Point Arguello. ♀. Types.		*D. delphis.* Off No Man's Land, Mass. ♀. U. S. F. C.	*D. delphis.* Atlantic coast. ♀.
	No. 1.	No. 2.		
	Inches.	*Inches.*	*Inches.*	*Inches.*
Total length	79.5	81.0	75.5	79.0
Length of pectoral fin	12.0	12.0	11.5	12.0
Expansion of flukes	18.0	17.5	15.5	18.0
Longitudinal width of flukes	5.0	6.0	6.0	6.25
Height of dorsal fin	7.0	7.5	7.0	8.0
Extremity of snout to pectoral fin	20.0	20.0	18.0	18.0
Extremity of snout to dorsal fin	36.0	37.0	35.0	37.25
Extremity of snout to angle of mouth	11.5	12.75	11.0	10.6
Extremity of snout to eye	13.0	13.75	12.5	12.0
Extremity of snout to blowhole	14.0	15.0	14.0	13.0
Girth at the anus	27.5	25.5	22.5	.....
Girth at front of dorsal fin	40.0	39.0	39.0	.....
Depth of caudal peduncle at origin of flukes	3.0	4.0	3.8	3.5

Remembering that these measurements were made by different observers on opposite sides of the continent, I think it will be conceded that they agree as closely as would measurements of different individuals of *D. delphis* made by different persons.

Scammon's description (p. 99) might be applied to the drawings of East-coast specimens, which I have called Nos. 1 and 2 (see p. 45), except that the dark mark before the pectorals in the former is black instead of gray. It is represented as black, however, in M. Fischer's figure of *D. delphis* var. *sooerbianus*.*

There is also among the drawings in the department of mammals a pencil-sketch by Mr. Dall, in which the boundaries of the lines and areas of color correspond almost exactly in position with drawings Nos. 1 and 2.

From the evidence now obtainable I am unable to distinguish between

* Cétacés de France, Pl. IV, fig. 2.

D. delphis and *D. Bairdii*, and must, therefore, regard the latter as identical with the former.

Delphinus Moorei and *D. Walkeri*, Gray.

These two species are founded on two drawings and two skeletons now in the Liverpool Public Museum. Both species are from a point in the South Atlantic, in the vicinity of Tristan da Cunha. I examined the types and original drawings, and verified from the manuscript the measurements given by Gray.* The colors of *D. Moorei* in the original, somewhat crude sketch, are, beginning from below, as follows: Light pure slate-gray; darker greenish slate gray; black. The colors of *D. Walkeri* are: Dirty white; light pure slate-gray; dark pure slate gray; black. The skulls are, as Gray has said, "so similar that it is not easy to point out any difference in words." They appeared to me identical with those of *D. delphis*. The skeletons I was unable to examine in detail, but they are certainly not notably different from those of *D. delphis*.

The colors of these two individuals, as represented in the sketches, are clearly far from identical. Nor are they exactly like those of any figure of *D. delphis* which I have examined. Gray brings up an important issue when he says:

> Considering that the coloring of the animals shows that they represent two species, one is struck with the very small difference exhibited in the skull by species showing such marked external differences, and can only conclude by thinking how hasty we have been when we have referred skulls received from very distant parts of the world all to *Delphinus delphis*, etc.†

This is quite the converse of Fischer's opinion, namely:

> Je pense que le dauphin vulgaire, qui semble habiter presque toutes les mers du globe, présente d'innombrables races ou variétés.

But what are the facts in the case under consideration? On the one hand we have two crude sketches of dolphins (not the dolphins themselves, it should be remembered), similar to each other and to *D. delphis*, but not absolutely alike. On the other hand we have the two skulls of the same individuals exactly resembling each other and *D. delphis*. Do they represent distinct species or otherwise? Gray decides by the differences of color in the sketches and affirms that they are distinct, while he admits that the skulls are alike. Prof. Fischer, on the other hand, would probably hold that, the skulls being alike, the differences in color must be regarded partly as mistakes of the artist and partly as real variations by which the different social families of *D. delphis* are distinguished from one another.

There is one fact not taken into account by Gray which leads one to believe that the latter opinion is correct, namely, that the proportions of

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* Lütken (Danske Vidensk. Selsk. Skr., 6te Raek., 1889), states that these sketches were not made by Walker, but by Capt. Andréa.

† Cat. Seals and Whales, p. 398.

D. Moorei are identical with those of *D. delphis*. In the following table the measurements of *D. Moorei* are placed by the side of those derived from the No Man's Land specimen of the same sex (♀) already referred to (p. 53):

Measurements.	D. Moorei (from Gray). ♀.	D. delphis. No Man's Land, Mass. U. S. Nat. Mus. ♀.
	Ft. In.	*Ft. In.*
Mouth to tip of tail	6 3½	6 3½
Length of mouth	11	11
Length of snout	5¼	5¼
Snout to eye	13	12⅞
Snout to snout-hole	13	13⅛
Snout to pectoral fin	18½	18
Snout to back fin	33	35

The agreement here is very close. The measurements of *D. Walkeri*, which I did not see, are stated by Gray to be "nearly the same as in *D. Moorei*." We have, therefore, two dolphins agreeing with *D. delphis* in their skulls and proportions, but represented as differently colored. I believe that they should be looked upon as individuals of that species, inaccurately represented, or at the most as varieties of that species.

Delphinus algeriensis Loche.*

Professor Fischer regards this species as possibly belonging to *P. marginatus*, but in the coloration, which alone is described, it appears to me to most resemble *D. delphis*. It is larger than any of the specimens of which Professor Fischer has given the dimensions, but is equaled by Scammon's specimens of *D. Bairdii* (=*D. delphis*).

Delphinus albimanus Peale.†

There is in the National Museum a mounted skin, in a bad state of preservation and without a trace of the original coloration, which is recorded as the type of this species. It does not closely resemble Peale's figure of the species. Upon cutting open the head, I found only a portion of the mandible in position. This and the bones of the manus, which I also exposed by cutting away the skin, agree with those of *D. delphis*. We may, I think, fairly conclude that Peale's species represents one of the varieties of *D. delphis*, like *D. forsteri*, which have areas of white on the fins. The type was from ———.

* Loche, Revue et. Mag. de Zoologie, 2d ser., XII, 1860, pp. 474, 475, pl. 22, fig. 1.

† Peale, U. S. Explor. Exped., Mamm. and Ornith., 1st ed., 1848, p. 33; Cassin, 2d ed., 1858, p. 29, pl. 6, fig. 1.

DELPHINUS DELPHIS.

Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of max. notches.	Breadth of beak— At its middle.	Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to— Anterior margin of superior nares.	Extremity of beak to— End of crest of pterygoid.	Breadth between— Orbits.	Breadth between— Hinder margins of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth at base of crown.	Number of teeth.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
....	43.3	26.6	9.0	4.5	2.3	7.1	22.6	4.9	30.7	32.2	16.1	14.4	7.1	5.3	...	....	....	6.6	...	49—49 50—48
....	46.7	28.2	9.3	5.3	2.3	7.4	23.3	5.7	32.8	34.2	17.1	14.4	7.2	5.4	..	...	....	....	...	48—48 — —
....	42.0	25.2	8.5	5.2	2.1	7.0	20.1	6.0	30.0	30.5	16.6	14.5	7.1	5.2	35.3	..	....	6.7	...	45?—45? 46—46
Jr	41.2	25.3	8.2	4.9	2.2	7.1	21.6	4.1	29.7	.....	16.3	13.9	6.9	4.9	35.5	....	....	6.6	...	?—49 47—47
....	43.2	25.9	9.1	4.8	2.2	7.3	22.6	4.7	31.5	32.8	16.4	14.1	6.4	5.1	....	....	....	....	0.25	[1]51—50 ?—?
..	[2]40.4	[2]22.9	9.5	5.2	2.4	7.6	(3)	....	[2]27.1	.....	17.0	14.4	7.1	5.5	....	....	....	...	...	.....
....	[2]40.6	[2]23.9	9.3	4.8	2.1	7.1	[2]20.3	3.9	[2]28.2	.....	15.4	[4]13.2	6.5	4.7	....	...	...	...	0.25	45+—45+ ?—?
....	.....	[5]24.1	9.3	4.9	2.0	7.1	[5]20.1	5.1	[5]28.9	.....	15.9	14.0	6.6	5.5	....	...	....	....	0.25	42+—42+ ?—?
...	.....	.....	.....	.....	...	.....	.....	..	.....	.....	....	.....	....	.....	40.6	6.1	23.5	7.2	....	.....
....	43.2	26.9	8.6	5.1	2.0	.....	23.0	..	31.7	.....	16.4	14.6	6.6	4.4	37.1	.	...	....	...	47—48 51—48
....	42.2	26.7	8.6	4.5	2.2	.....	22.2	...	31.2	.....	16.5	13.1	.....	.....	...	..	.	...	...	50—51 ?—?
..	45.7	28.9	9.9	5.3	23.4	7.6	24.7	5.1	34.3	35.3	17.0	14.0	7.4	5.3	40.0	5.3	15.9	6.6	...	50—50 48—47
....	45.7	28.2	9.2	5.3	2.3	8.0	24.1	4.8	32.5	.....	17.3	14.2	7.0	6.2	38.5	5.:	16.2	7.1	0.25	50—50 51—50

1625a	Brit. Mus.[a]		South Seas		47.0	29.2	9.2	4.8	2.3	7.8	24.9	4.8	34.0	31.9	14.0	14.0	7.5	6.0	39.4	5.7	16.5	6.6	0.25	42—42 46—47
1472a	do	*D. major*			52.7	33.0	10.5	5.6	2.5	7.6	28.7	5.7	38.5	39.4	17.3	14.1	8.4	6.6	44.4	6.2	26.7		0.32	48—50 46—50
(b)	Liverpool Pub. Mus.				46.3	29.0	10.2	5.7	2.9		24.1		33.4		17.8	14.0			39.3					?51—?52 48—49
574b	Cambridge Mus.[9]				46.7	29.5	10.0	5.2	2.2	7.0	22.9		33.0	35.2	16.8	13.8	7.8	5.8	38.9	6.4				51—54 48—50
574a	do		Bahama Islands.		47.4	29.2	10.2	5.6	2.4	7.6			34.8	35.5	17.6	13.8	7.5	5.8						—?—47 ——46
3079a	Paris Mus			Jr	37.4	22.1	8.4	4.6							15.5									
15781	U. S. Nat. Mus		New York Bay	do	41.9	25.3	8.2	4.9	2.2	7.1	21.6	4.1	29.7		16.3	13.9	6.9	4.9	35.5			6.6		—?—49 47—47
3885	do		Unknown		42.0	25.2	8.5	5.2	2.1	7.0	20.1	6.0	30.0	30.5	16.6	14.5	7.1	5.2	35.3			6.7		?45—45? 46—46
7063	do		N. Y. Harbor		43.3	26.6	9.0	4.5	2.3	7.1	22.6	4.9	30.7	23.2	16.1	14.4	7.1	5.3				6.6		49—49 50—48
3073a	Paris Mus		Unknown	Ad	43.8	27.4	9.2	5.1							16.0									
3072a	do		Coast of Hérault	do	44.5	27.4	8.9	5.1							16.8									
3075a	do		Unknown	do	41.5	27.2	9.2	5.6							17.0									
3077a	do		Coast of Algeria, 1874.	do	44.5	27.2	8.9	5.1							16.3									
3078a	do		Coast of Algeria	do	45.0	28.2	8.6	4.8							16.0									
3074a	do		Unknown	do	45.5	28.0	9.4	5.6							17.5									
318f	British Mus				45.7	28.2	9.1	5.3	2.3	8.0	24.1	4.8	32.5		17.3	14.2	7.0	6.2	38.5	5.3	16.1	7.1		50—50 5.—50
"b"	Liverpool Pub. Mus.		Unknown	Old	46.4	29.0	10.2	5.7	2.9		24.1		33.4		17.8	14.0			39.4					?51—?52 48—49
20873	U. S. Nat. Mus		Off Block I'd, R. I.	Ad	46.7	28.2	9.3	5.3	2.3	7.4	23.3	5.7	32.6	34.2	17.1	14.4	7.2	5.4						48—48
574a	Cambridge Mus.		Sydney Mus		46.7	29.5	10.0	5.2	2.2	7.0	22.9		33.0	35.2	16.8	13.8	7.8	5.8	38.9	6.4				51—54[a] 48—50
81b	Paris Mus		Unknown	Ad	46.8	28.7	9.9	6.1							18.5									
3574a	Cambridge Mus.		Bahama Isl'ds		47.4	29.2	10.2	5.6	2.4	7.6			34.8	35.5	17.6	13.8	7.5	5.8						—?—47 —?—49

[1] May be three or more small teeth on each side.
[2] Tip of beak broken; must add at least 3cm.
[3] Tip of beak broken; must add about 1.5cm.
[4] Twice one-half the width; the fossæ are broken.
[5] Tip of beak broken; must add at least 7cm.
[6] This mandible is from a different individual from the type-skull.
[7] Labeled D. Forsteri.
[8] Labeled D. longirostris.
[9] From Sydney Museum.

DELPHINUS LONGIROSTRIS Cuvier (ex Dussumier).

Delphinus longirostris Dussumier, Cuvier, Règne Animal, 2d ed., 1829, p. 288; Gervais, Ostéog. des Cétacés, 1880, p. 604, Pl. XXXIX, figs. 10, 11.

The name *Delphinus longirostris* was employed by Gray in the Spicilegia Zoologica a year prior to the publication of the second edition of the Règne Animal, but it appears that Gray's specimen really belonged to another genus, viz, *Prodelphinus*,* and there is therefore no impropriety in retaining for the long-beaked, many-toothed *Delphinus* the name which Cuvier took from Dussumier's manuscripts. There is some question, however, as to the specimen which Cuvier had in mind, and the determination of this point is made the more necessary by Professor Flower's recent interesting discovery that the specimen which Gray made the type of his *D. capensis* is a true *Delphinus*, with a longer beak and more numerous teeth than *D. delphis* (*List*, p. 26).

Cuvier's diagnosis of the species, if diagnosis it may be termed, is very brief. He simply states that it "surpasses even the common dolphin in the number of its teeth, having from fifty-five to sixty throughout. From the coast of Malabar."† There is in the Paris Museum a skull, No. *a*3065, labeled "*Eudelphinus longirostris*, Malabar. Dussumier, 1827." This is undoubtedly the skull figured by Van Beneden and Gervais (Ostéog., Pl. XXXIX, figs. 10, 11), but those authors give the number of teeth as $\frac{55-55}{54-53}$,‡ although their figure shows 65–63 teeth in the upper jaw. In the same skull I counted 65–65 teeth in the upper jaw. Pucheran, on the other hand, gives the formula $\frac{55-55}{53-54}$, corresponding to that given by Van Beneden and Gervais in the text, except that the number on the left and right sides of the mandible, respectively, is reversed.

No mention is made of this species in the first edition of the Règne Animal; it appears for the first time in the second edition, of which the first volume was issued in 1829, two years later than the date on the label of Dussumier's specimen. From the evidence at command I believe that the skull which I examined is identical with that which Cuvier had in mind.

Whether this species is identical with Gray's *D. capensis* (Spic. Zool., 1828, p. 2) remains to be determined. If such proves to be the case, Gray's name will have to be adopted for the species. Professor Flower

* Pucheran (Rev. and Mag. de Zoologie, 1856, 452) is at a loss to understand how Gray could apply the terms "osse palatino carinato" (Spicilegia, p. 2) to a skull in which the "palate" is flat, but had he studied the matter more closely I think he would have concluded, as I have, that Gray's term "palate-bone" means in reality the pterygoid.

† McMurtrie, Cuvier's Animal Kingdom, i, 1831, p. 202. The original second edition of the Règne Animal is not at command.

‡ Ostéog., p. 604.

states that the skull which he extracted from the type-skin of *D. capensis* has a longer beak than any other *Delphinus* in the collection, but he does not specify whether absolute or relative length is intended and does not give the number of teeth.

The skull No. *a*3065, which I believe to be the type of *D. longirostris*, is certainly different from that of *D. delphis*. The skull is 49.5^{cm} long, the beak being 67.9 per cent. of this length, a proportion not reached by any skulls of *D. delphis* which I have examined. It is also much narrower across the orbits, and the teeth, as already stated, are more numerous, viz, $\frac{65-65}{57-58}$. The temporal fossæ are large and rounded, the pterygoids very narrow and sharply keeled. The palatine grooves are very deep, the intermaxillæ are very high near the notch, and are rounded. The specimen does not appear to be old. I did not find any other which I thought specifically identical with it.

Table of measurements.

DELPHINUS LONGIROSTRIS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
							At base of maxillary notches.	At its middle.		
*a*3065	Mus. d' Hist. nat.	*D. longirostris*..	Malabar ..	Ad.	*Cm.* 49.5	*Cm.* 23.7	*Cm.* 8.4	*Cm.* 3.8	*Cm.* 2.0	*Cm.* 7.4

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Breadth of anterior nares.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
*a*3065	30.2	4.7	38.1	38.8	14.7	12.9	7.4	6.1	43.7	9.9	.....	6.3	4.6	$\frac{65-65}{57-58}$

DELPHINUS CAPENSIS Gray.

Delphinus capensis, Gray, Spicilegia Zoologica, 1, 1828, p. 2.

For remarks upon this species, see p. 58.

DELPHINUS ROSEIVENTRIS Wagner.*

Delphinus roseiventris, Wagner, Schreber's Säugeth., Pl. CCCLX, fig. 1.
Dauphin à ventre rose, Jacquinot & Pucheran, Zool. Voyage Astrolabe et Zélée, iii, 1853, p. 39; Atlas, Pl. 22, fig. 2, Pl. 23, figs. 3–4.

I am led to retain this species in the genus *Delphinus* (restricted) on account of the form of the palate and the style of coloration of the exterior.

Pucheran and Jacquinot had three skulls before them when at work upon their account of the species. Two of these skulls, Nos. *a*3026 and *a*3027, are in the Paris Museum; the third (apparently) is No. 569 of the museum of Cambridge University. There are figures of both skull and exterior in the atlas of the voyage, and the former is also figured in Messrs. Van Beneden and Gervais' Ostéographie, Pl. XXXVIII, figs. 6 and 6*a*.

The skulls are peculiar for their small size and the unevenness of the surface of the different bones. The palate shows a condition in some measure intermediate between that found in *Prodelphinus* and that characteristic of *Delphinus*. The pterygoids are narrow and small, as in *Delphinus*, and a distinctly marked channel extends on either side of them nearly to the extremity of the beak. These channels are in no wise so deep, however, as in *D. delphis* or *D. longirostris*

In proportions it differs from the other species of the genus. Its small absolute size would alone serve to distinguish it from the remaining species.

Table of measurements.

DELPHINUS ROSEIVENTRIS.

ber.							Breadth of beak— ary		maxillæ at beak.	h between s of inter- nally.

[redacted]

Table of measurements—Continued.

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Breadth of anterior nares.	Number of teeth
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
a3026	21.6	3.3	27.9	.....	12.7	10.6	6.1	4.3	32.8	6.4	.....	5.3	3.2	$\frac{47+-}{48-?}$
569	20.3	.....	25.9	27.0	12.0	.....	.....	.....	30.0	5.3	.....	.....	.....	$\frac{48-48?}{45-45}$

5. PRODELPHINUS Gervais.

Prodelphinus, Gervais, Ostéog. des Cétacés, 1880, p. 604.

This genus is closely allied to *Delphinus* and *Tursiops*. The chief character which has been brought forward as separating it from *Delphinus* is a negative one—the absence of deep lateral palatine grooves. From *Tursiops* it is distinguished by its smaller and less numerous teeth and (generally) more numerous vertebræ. These latter characters, it must be confessed, are not very trenchant, and it may be found necessary at a later day to unite *Prodelphinus* with *Tursiops*.

The genus comprises a large number of nominal species, for the most part founded upon single skulls. Nearly every large collection contains a considerable number of skulls which may be assigned to this genus. It is found, however, in many cases that when a large number of these skulls is brought together they tend to form continuous series. The differences between the extremes of these series are often striking and perfectly definable, but in the middle they melt away and elude definition. From this fact and from the absence of material the task of revising the species of this genus is a very difficult and disheartening one. Professor Flower has, however, led the way (in the *Characters and Divisions* and also in the *List*) to a better knowledge of the group, and in his opinions I for the most part concur.

In the succeeding pages I shall consider about 23 species which appear to me to belong to this genus, including some which have not been touched upon by Professor Flower. I bring together the names of all these species in the following table:

Prodelphinus cæruleo-albus (Meyen).
euphrosyne (Gray).
styx (Gray).
euphrosynoides (Gray).

Prodelphinus dorides (Gray).
tethyos (Gervais).
marginatus (Duvernoy).
dubius (Cuvier).

Prodelphinus doris (Gray).
plagiodon (Cope).
normalis (Gray).
brevimanus (Wagner).
frœnatus (F. Cuvier).
frontalis (Dussumier).
attenuatus (Gray).
capensis (Gray).

Prodelphinus punctatus (Gray).
malayanus (Schlegel).
pseudodelphis (Wagner).
longirostris (Gray).
stenorhynchus (Gray).
microps (Gray).
alope (Gray).

Several other species were assigned to this genus by Professor Flower which seem to me to belong elsewhere. Of these *C. obscura* Gray, *C. similis* Gray, and *Electra thicolea* Gray, seem to me to belong to *Lagenorhynchus; Delphinus roseiventris*, Hombron and Pucheran, I prefer to leave in the genus to which it was originally assigned; *D. superciliosa*, Lesson and Garnot, is not sufficiently well defined to admit of an opinion.

PRODELPHINUS CŒRULEO-ALBUS (Meyen).

Delphinus cæruleo-albus, Meyen, Nova Acta Nat. Curios., XVI, pt. 2, 1833, pp. 609, 610, pl. 43, fig. 2; Wagner, Schreber's Säugeth., 7th Th., 1846, p. 336, pl. 363; Gray, Zool. Erebus and Terror, 1846, p. 42.

Lagenorhynchus cæruleo-albus, Gray, Catalogue of Cetacea, 1st ed., 1850, pp. 100, 101; 2d ed., 1866, pp. 268, 269.

This species is based on a specimen obtained by Meyen on the east coast of South America, in the vicinity of the Rio de la Plata, and deposited in the Zoological Museum of Berlin.

The skull, which I was enabled to examine in 1887 through the kindness of Dr. Hilgendorf, resembles that of *P. euphrosyne*, and also in some respects that of *P. doris*. It is peculiar in having very small oval temporal fossæ, which are directed upwards strongly behind. The intermaxillæ are much arched in the middle of the rostrum, and the pterygoids are strongly carinate. In the skeleton I counted 7 cervical vertebræ, 14 dorsal vertebræ, and 52 lumbars and caudals, but a few more should probably be added to the number of the latter. The transverse processes of the lumbar vertebræ are slender and are directed forwards.

The color of the species, as indicated in Meyen's figure and description, is apparently quite different from that of any other known species. (See *Synopsis*, p. 163.)

Why this species was included by Gray in the genus *Lagenorhynchus* is not clear, since the form of the skull and beak are characteristic of *Prodelphinus*. Cassin's reasons for associating with this species the *Delphinus albirostratus* of Peale are equally unsatisfactory.* I have been unable to identify the latter species.

* Cassin, U. S. Explor. Exped., Mammalogy and Ornithology, 2d ed., 1858, p. 31; Atlas, pl. 6, fig. 2.

PRODELPHINUS EUPHROSYNE (Gray).

Delphinus euphrosyne, Gray, Zool. Erebus and Terror, 1846, p. 40, Pl. XXII.
Delphinus styx, Gray, Zool. Erebus and Terror, 1846, p. 39, Pl. XXI.
Delphinus tethyos, Gervais, Bull. Soc. d'Agric. Hérault, XL, 1853, p. 150, pl. 1, figs. 1–4.
Delphinus marginatus, Pucheran, Revue et Mag. Zool., 2me sér., VIII, 1868, p. 545, pl. 25.
Tursio dorcides, Gray, Cat. Seals and Whales, 1866, p. 400.
Clymene dorides, Gray, P. Z. S., 1866, p. 214.
Clymenia euphrosynoides, Gray, Synop. Whales and Dolph., 1868, p. 6. (No description.)

The type of the species above named, together with three skulls in the Paris Museum (Nos. *a*3022–*a*3024), and skull No. 179 from Jamaica, in the collection of the Royal Victoria Hospital, Netley, agree well together, both as regards absolute size, relative proportions, and the disposition of parts. The length of the beak varies from 56.2 per cent. to 61.5 per cent. of the length of the entire skull. From the series which groups itself around the type of *P. doris* they are distinguished by their greater absolute size, relatively longer beak, broader intermaxillæ, and larger temporal fossæ, and by the possession of rather a larger number of teeth. It must be confessed, however, that the recognition of these and similar characters is rendered difficult, as already stated, on account of the blending of differences at the extremes of the series. The type *P. euphrosyne* in the Norwich Museum (where I examined it) is well figured in Gray's *Synopsis*, pl. 22. It appears to be the skull of an adult individual.

The type of *D. styx* is lost and we have only Gray's figure (*Synopsis*, pl. 21) to work from. The obliging secretary of the Royal United Service Institution informed me by letter that this skull, with others, had "long ago been disposed of." I agree with Professor Flower that *D. styx* is probably identical with *P. euphrosyne*. Indeed, Gray himself was inclined to take the same view (see the *Catalogue*, p. 250). There is little, however, except its rather large size by which to distinguish it from *P. doris*.

D. tethyos, Gervais, is founded on a single skull from Valreas, at the mouth of the Orb. It is broken behind and appears as if diseased along the frontal suture on the left side. The temporal fossæ are rounded. The pterygoids are not wide and have a sharp keel. Gervais compared this species only with *Delphinus delphis* and *Prodelphinus dubius* and *frænatus*. Whether he regarded the two latter species (which he thought identical) as identical with or distinct from *P. euphrosyne* we have no means of knowing. At all events we lack the authority of his opinion for uniting *P. tethyos* with *P. euphrosyne*. On the other hand there seems equally to be no reason for regarding these species as distinct. If there are characters by which the skulls may be

really separated they have yet, as Professor Flower has already said, to be detected.

In *D. marginatus*, Pucheran, we have for the first time in this genus an instance in which both the external and osteological characters are known. We are fortunate enough to have also complete data regarding three individuals of a closely allied species, *P. plagiodon*, Cope, and are able to point out the distinctions between the two species very satisfactorily (see p. 67). As regards the skull of *P. marginatus*, it so very closely resembles that of *P. euphrosyne*, both in size, proportions, and details of structure, that I am unable to find any ground for the separation of the species. Professor Flower and Dr. Fischer both advance the same opinion, though with some hesitation.

Clymene dorides and *Clymenia euphrosynoides*, Gray.

The type-skulls of these two species are of the same absolute length and exhibit the closest agreement in the relative proportions of parts. No one who has examined them side by side, can, I think, doubt that they represent the same species. They are smaller than the type of *P. euphrosyne*, but agree with that skull in proportions and details of structure. *C. euphrosynoides* was not described by Gray, and the name has therefore no validity except for those who hold that reference to a figure answers in the place of a description.

Table of measurements.

PRODELPHINUS EUPHROSYNE.

ue number.	Collection.	Type of—	Locality.	age.	ngth.	of beak.	Breadth of beak— of maxillary otches.	iddle.	of internaxillæ at iddle of beak.	breadth between margins of intermax- oximally.
[redacted]										

Table of measurements—Continued.

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
1473*a*	21.8	4.8	30.5	32.2	18.7	15.2	6.3	4.6	37.1	5.1	21.6	6.6	.25	42— 41 44— 44
351*a*	22.9	3.8	30.5	.....	.....	.....	5.8	4.5	.....	.....	.....	.....	.25	50— 50 ?— ?
179	21.6	4.6	29.5	.....	17.8	14.0	6.3	4.3	.....	4.3	.....	6.6	....	?45— 45 ?45— 45
n. n.	.....	....	.....	.....	20.3	.....	6.1	4.0	41.1	.....	.....	.....	....	45— 45 43— 43
n. n.	25.4	4.6	34.5	35.8	20.3	15.3	6.3	5.1	40.9	*5.6	.....	7.4	...	?48—?48 45— 44
*a*3021	21.6	4.3	30.3	32.0	19.8	15.3	7.1	5.8	36.2	5.3	.....	7.2	....	46— 45 41— 42
*a*3022	21.1	4.3	29.2	31.6	19.6	14.8	5.6	4.3	35.6	4.7	.....	6.3	....	44— 46 44— 45
*a*3023	22.1	4.6	31.1	.....	18.8	14.0	6.9	4.8	37.1	5.6	.....	7.4	....	?46—?48 44— 43
*a*3024	24.2	4.3	33.5	35.3	21.0	15.0	7.1	4.8	39.9	5.1	.....	6.9	....	?42— 42 ?40— 40

*Extreme.

PRODELPHINUS (?) LATERALIS Peale.

Delphinus lateralis, Peale, Mamm. U. S. Expl. Exped., 1st ed., 1848, p. 35, Pl. VIII, fig. 1.

Lagenorhynchus lateralis, Cassin, Mamm. U. S. Expl. Exped., 2d ed., 1858, p. 32, Pl. VII, fig. 1.

Every student must be struck with the general resemblance of Peale's figure to the figure of *P. marginatus* given by Pucheran.* The color of the two type-specimens seems to have been similar, but there are certain differences which make it impossible to refer *P. lateralis* to *P. marginatus* without question.

The general color of the upper surfaces of *P. marginatus* is represented as black, while Peale's animal is said to have been "light purplish-gray." It should be borne in mind, however, that the specimens of the former species were drawn some time after they were captured, while it is probable that Peale's sketch was made immediately. The general arrangement of the dark bands is much alike in both figures, and the color of the fins is identical.

On the other hand, there is nothing corresponding to the spots so plainly indicated in Peale's sketch to be found in the drawing of *P.*

* Revue et Mag. de Zool., 2me sér., VIII, 1856, p. 545, pl. 25.

marginatus. The dorsal fin is situated much farther back in *P. marginatus* than in *P. lateralis*.

The localities from which the different specimens were derived are far apart.

On account of the presence of these differences, real or apparent, and of others which may be perceived by comparison of the figures, it is not possible to unite the species at the present time.

Why Cassin should have regarded Peale's species as belonging to the genus *Lagenorhynchus* is not clear. The shape of the beak is certainly not characteristic of that genus. Since *Prodelphinus* is not distinguishable from *Delphinus* by external characters in the present state of knowledge, I have referred Peale's species to this genus with a mark of interrogation. Its close resemblance to *P. marginatus* externally is my chief reason for placing it here.

PRODELPHINUS PLAGIODON Cope.

Delphinus plagiodon, Cope, Proc. Acad. Nat. Sci. Phila., 1866, p. 296.

Complete data regarding three individuals belonging unquestionably to this species are at command. The skeletons, photographs of the exterior, certain of the viscera, and measurements of these specimens are in the collection of the National Museum. There is also a cast of one individual. One specimen, No. 22017, was captured off Hatteras, North Carolina, by the naturalist of the United States Fish Commission steamer *Albatross*. The second specimen, No. 15030, was purchased by the Smithsonian Institution from the fishermen of Pensacola, Fla., through Messrs. Warren & Stearns of that place. A description of this individual has been given by the writer in the Smithsonian Report for 1884 (pt. 2, pp. 317–324, Pls. I–VI). It is therein identified with *P. plagiodon* (Cope), which species is in turn regarded as apparently identical with *P. doris* (Gray). While, after further reflection and comparison of specimens, I am more than ever convinced of the correctness of the identification of the freshly-acquired specimens with *P. plagiodon* (Cope), on the other hand I begin to doubt whether the latter species should be regarded as identical with Gray's *Clymenia doris*. If the relative proportions of the species alone are considered, the two species do, indeed, appear to be identical, but when the absolute size is regarded the matter assumes a different aspect. The type-skull of *P. plagiodon* is from a youngish individual, yet it is larger than the type of *P. doris* or any of the skulls called *doris* or *dubius* in the collections of the British Museum, the Royal College of Surgeons, and the Museum d'Histoire naturelle. The Pensacola and Hatteras specimens, which are clearly not old (the epiphyses of the vertebral centra are not anchylosed), are still larger than the type of *P. plagiodon*. They exceed the type of *P. doris* in length by 2.55 inches and 2.3 inches, respectively. The Pensacola skull is more than an inch longer than the largest of the twenty-nine skulls of the

doris series which I examined in the European collections. Furthermore the teeth are considerably larger than in *P. frœnatus*. They measure 5^{mm} in diameter at the base, and but 4 to $4\frac{1}{4}$ are included in 26^{mm} (=1 Danish inch). In Dr. Lütken's specimens the teeth measured about 3^{mm} in diameter, and 5 to $5\frac{1}{2}$ were included in a Danish inch.

I am inclined to believe that *P. plagiodon* must be regarded as a larger species than *P. doris*, though the skulls of both are much alike in appearance.

The skull of *P. euphrosyne* differs from that of *P. plagiodon*, chiefly by its more numerous teeth and smaller temporal fossæ. The skeleton of the type of *P. marginatus* gives the following formula: C. 7; D. 15; L. 21; Ca. 23 = 76.

The two specimens of *P. plagiodon* give the following formulæ: No. 15030 ♂ Pensacola, Fla., C. 7; D. 14; L. 19; Ca. 29 = 69. No. 22017 ♂ Hatteras, N. C., C. 7; D. 14; L. 19; Ca. 28 = 68.

Other differences in the skeleton are as follows:

In *P. marginatus*.	In *P. plagiodon*.
(1) The third cervical vertebra is united to the second.	(1) It is free.
(2) The neural spines cease at the 68th vertebra.	(2) At the 60th vertebra.
(3) The transverse processes cease at the 63d vertebra.	(3) At the 54th vertebra.
(4) The foramina at the base of the transverse process begin at the 59th or 60th vertebra.	(4) At the 49th vertebra.
(5) The centra are flattened and oblong at the 68th vertebra.	(5) At the 61st vertebra.
(6) The anterior zygapophyses end at the 28th vertebra, and begin again at the 44th vertebra.	(6) They end at the 29th vertebra (as distinct processes) and begin again at 40th vertebra.
(7) The phalanges are as follows: I, 1; II, 8(+); III, 6; IV, 2; V, 0.	(7) As follows: I, 2; II, 9; III, 7; IV, 3; V, 1.

P. plagiodon is readily distinguishable from *P. marginatus* (= *P. euphrosyne*) externally by its spotted skin.

1. PRODELPHINUS MALAYANUS (Lesson).

Delphinus malayanus, Lesson, Voyage de la Coquille, Zool., I, pt. i, 1826, p. 184; atlas, pl. 9, fig. 5; Schlegel, Abhandl. Gebiete Zool., Hft. 1, 1841, p. 20, Pl. I and II, fig. 2; Pl. IV, fig. 3.

† *Delphinus brevimanus*, Wagner, Schreber's Säugeth., 1846, pl. 361, fig. 2.

† *Dauphin à petites pectorales*, Jacquinot & Pucheran, Voyage de la Astrolabe & Zélée, Mamm. & Ois., 1853, p. 38; atlas, pl. 21, fig. 2; pl. 23, figs. 7 and 8.

2. PRODELPHINUS ATTENUATUS (Gray).

Steno attenuatus, Gray, Zool. Ere. & Terr., 1846, p. 44, Pl. XXVIII.

Delphinus pseudodelphis, Wiegmann in Schreber's Säugeth., pl. 358; Wagner in do., 1846, p. 332; Schlegel, Abhandl. Gebiete Zool., Hft., I, 1841, p. 22.

Steno capensis, Gray, Proc. Zool. Soc., London, 1865, p. 522.

Clymene punctata, Gray, Proc. Zool. Soc., London, 1865, p. 738; Cat. Seals and Whales, 1866, p. 398, fig. 101.

3. PRODELPHINUS FRŒNATUS (F. Cuvier).

Delphinus frœnatus, F. Cuv., Mamm. de la Ménag., liv. 58, liv. 59; Hist. nat. des Cétacés, 1836, p. 155, pl. 10, fig. 1.
Delphinus frontalis, Dussumier, in Cuv. Règne Animal, I, p. 288. (*Fide* Wagner.)
Delphinus doris, Gray, Zool. Ere. & Terr., 1846, p. 39, Pl. xx.
? *Delphinus dubius*, G. Cuv., Ann. du Muséum, xix, 1812, p, 14.
Delphinus clymene, Gray, Cat. Seals and Whales, 1866, p. 249.
Clymenia normalis, Gray, Proc. Zool. Soc. London, 1866, p. 214.

The relationships of these three species (if such they be) are so close that I have thought best to consider them conjointly. Professor Flower has said (*List*, p. 30) that—

> Though single well-marked specimens of Gray's *Clymenia doris* and *Steno attenuatus* may be so unlike as to justify their being placed in distinct species, yet when a large series, such as those of the British Museum and College of Surgeons combined, are compared together, the two extremes pass so insensibly into each other that it is difficult to avoid the suspicion that the differences depend upon age, or sex, or on individual variation. Unfortunately these forms are known at present only by skulls. When the remaining parts of their organization can be correlated with them probably other specific distinctions will be demonstrated.

That it is unsound to combine all these nominal species at present appears from the fact that there are indications that the exterior of the individuals from which some three or four of the skulls were derived differed much in appearance.

In the atlas of the Voyage of the *Coquille* (pl. 9, fig. 5) is figured the exterior of a dolphin, taken between Java and Borneo, and in the text styled *D. malayanus*. With this species Schlegel, in the *Abhandlungen*, identifies a skull from Celebes, two skulls from Java, and a young individual, somewhat over one and one-half feet long, from Borneo. This individual appears to have been a suckling, as is indicated both by its size and by the fact that "it still had some hairs on the sides of the snout," and that the teeth were "still only incompletely broken through the gums." "The color is bluish-black gray, the under parts somewhat clearer." The skull from Celebes, which I examined, closely resembles the type of Gray's *C. attenuatus*, but is absolutely larger, with relatively longer beak and shorter tooth-row. The number of teeth is, however, nearly the same.

Of the individual which served for the type of *D. malayanus* of the *Coquille* no parts appear to have been brought home. The color is described as "uniformément cendrée."* It was 5 feet 11 inches (French) long.

It is, of course, impossible to determine whether Schlegel's identification of his specimens with *D. malayanus* was a correct one, but the young individual was at all events not unlike that species in color.

In the atlas of the Voyage of the *Astrolabe* and *Zélée* (pl. 21, fig. 2; pl. 23, figs. 7 and 8) are figured the skull and exterior of another dark

*All the figures on plate 9 of the atlas of the *Coquille* are colored bluish-green, which is evidently not intended as the natural color.

gray species, called *Dauphin à petites pectorales*. Gray (*Catalogue*, page 236) states that it was from Banda, Singapore, but on what authority I have been unable to determine. In the figure of the exterior the pectoral fins are entirely too small. The measurements in the text agree well with those given by Lesson for *D. malayanus*. Furthermore, the skull figured on plate 23, figs. 7 and 8, very closely resembles the skull which Schlegel identified with *D. malayanus*. It is a little smaller and has rather smaller temporal fossæ, but otherwise agrees with Schlegel's skull in details of structure.

From such evidence as presents itself it seems to me probable that Schlegel was correct in his identification, and that *D. malayanus* Lesson and *D. brevimanus* Wagner are identical.

That this species is distinct from *P. attenuatus*, though closely related, is apparently indicated by the differences in the proportions derived from the measurements given on page 72.

In 1865 Gray, in the *Catalogue*, page 398, described a species under the name of *Clymene punctata* from a specimen in the Public Museum, Liverpool. Through the kindness of Mr. Moore, I examined the original material upon which this species was based. My time was so limited, however, that I could only examine and measure the skull and note the colors in the original sketch of the exterior.

The skull very closely resembles *P. frœnatus* both in size and proportions, and I think there can be little doubt that it is identical with the latter specifically. The exterior is as Gray figured it (*Catalogue*, page 398, fig. 101). The upper parts (see diagnosis, p. 166) are black, the under surface; the lower jaw, pectoral fin, and the band over the tail are very dark slate-gray. There are numerous white spots on the sides. The measurements and locality are correctly quoted by Gray from the original.

The exterior in this species is plainly different from that of *P. malayanus*, while, as already stated, the skull is precisely like *P. frœnatus*.

The skull of *P. attenuatus* closely resembles two others, namely, one called *D. pseudodelphis* Wiegmann, in the Leyden Museum, and the type *Steno capensis* Gray. I examined in the Leyden Museum a skull which in all probability is that referred to by Schlegel in the *Abhandlungen* as *D. pseudodelphis*. It closely resembles Gray's *S. attenuata*, and if Schlegel's identification is correct, *D. pseudodelphis* would, therefore, seem to be identical with Gray's species. If the identification can be proven correct, *pseudodelphis* would supplant *attenuata* as the name of the species under consideration.

The type-skull of *Steno capensis*, Gray, scarcely differs at all from *S. attenuata* except in size. It is about an inch longer than the type-skull of the latter species. Professor Flower holds that the two species are "not distinguishable" (*Char. and Div.*, p. 498), and there is every reason to regard this opinion as the correct one.

The evidence at command seems, therefore, to warrant the union of the three nominal species *D. pseudodelphis*, Wieg., *S. attenuata*, and *S. capensis* into one.

Prodelphinus frœnatus (F. Cuv.).

The two skulls in the Paris Museum labeled *P. frœnatus*, and presumably the types of that species, are precisely like the type-skull of *P. doris* (Gray). The exterior of *P. frœnatus* is different from that of *P. punctata* (=*P. attenuata*). It lacks the spots of the latter species, and the pectoral fins are black, like the back, rather than light-colored, like the belly.

I was formerly inclined to regard *Delphinus plagiodon* as probably synonymous with *P. doris* (=*P. frœnatus*). It is somewhat different in color, however, and the greater size of the skulls now at command appears to indicate that it is a somewhat larger species than *P. frœnatus*.

Supplementary remarks.

Dr. Lütken, in his recently-published contribution to the history of *Prodelphinus* and other genera, to which reference has already been made, gives much new information in regard to this very perplexing group of species.* He presents measurements and other data regarding four skeletons and three skulls of *P. doris* (=*P. frœnatus*), and the same regarding two skeletons which he identifies with *P. attenuatus*.

These two species have the following vertebral formulæ: *P. doris*, C. 7; D. 14; L. 16–18; Ca. 31–33=70. *P. attenuatus*, C. 7; D. 15; L. 21; Ca. 36–38=79–81.

One individual of *P. doris* is represented in a sketch by Captain Andréa as being dark on the back, white on the belly, and covered with very numerous spots. Another individual is represented as dark greenish-gray on the back, light gray on the belly, and with but few spots or streaks, which are confined to the region in front of the pectoral fin. There is a well-marked band between the pectoral fin and the forehead. (A copy of Dr. Lütken's figures is given in the plates. These figures are given only to show the color-marking; the outlines are diagrammatic.) *P. attenuatus* is represented as dark on the back and ashy-gray below.

Except as regards their different vertebral formulæ and the correlated disposition of the processes and foramina of the vertebræ, the specimens identified by Dr. Lütken as *P. attenuatus* might be placed under *P. frœnatus*. I am not aware, however, that any such considerable variations in the number of vertebræ as are here pointed out have been recorded as occurring among individuals of a single species.

* Lütken, K. Danske Vidensk. Selsk. Skrifter, 6te. Raekke, v, 1889.

Nevertheless, since the skulls and external proportions of the specimens identified by Dr. Lütken as *P. doris*, *attenuatus*, and *alope* are almost identical, the question naturally arises whether the difference in number of vertebræ may not possibly be due to individual variation.

It would be very interesting in this connection to know the vertebral formula of Gray's *P. punctatus*, the skull of which seems to me identical with the type-skull of *P. attenuatus*, but whose style of marking resembles Dr. Lütken's *P. doris*, No. 4. Since Dr. Lütken states that the types of Gray's *D. moorei* and *D. walkeri* (=*D. delphis*), which are labeled "Walker's No. 1" and "Walker's No. 2," were really obtained by Captain Andréa, it occurs to me that the type of *D. punctatus*, which is labeled "Walker's No. 3," may also have been obtained by Captain Andréa. It is from a point near the Cape Verde Islands, only a few miles distant from the place in which Dr. Lütken's *P. doris*, No. 2, was derived, and was probably caught in the same year.

The specimen which Dr. Lütken places under "*P. obscurus* (Gray)."* certainly does not belong to that species, which is, I believe, a *Lagenorhynchus*. In color this specimen seems to me intermediate between the two specimens figured on page 34.† In external proportions it agrees with *P. doris* No. 4,‡ and in skeletal proportions with this and other specimens on pages 32–33.

In conclusion, it may be said that it is necessary for the present to regard *P. attenuatus* as a distinct species, on account of its different vertebral formula.

The difference in color between *P. frœnatus* and Dr. Lütken's specimen of *P. doris* may be regarded as due to difference in age. As already stated, however, if it should be shown hereafter that the number of vertebræ is subject to variation, there is apparently no other reason why all the specimens should not be regarded as belonging in one variable species.

Op. cit., p. 42. †*Op. cit.* ‡*Op. cit.*, p. 31.

Table of measurements.

PRODELPHINUS MALAYANUS.

	Length of beak.	Breadth of beak—		Breadth of internaxillary at middle of beak.	Greatest breadth between outer margins of internaxillary proximally.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth row of mandible.	Depth between angle and coronoid process.		Number of teeth.
		At base of maxillary notches.	At its middle.					Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Anterior margin of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*		
3	22.9	8.7	3.8	2.0	6.1	19.2	4.3	26.2	.....	14.7	11.8	6.5	5.0	32.9	7.4	19.3	5.3	.....	43—43
																			42—42
3	25.1	9.3	4.2	2.4	6.7	21.4	4.3	29.2	30.0	16.4	11.9	6.7	5.6	35.0	7.5	20.3	5.7	.....	40—41
																			38—37
8	25.4	12.6	4.1	2.2	6.8	21.6	4.2	29.5	30.5	16.0	...	6.0	4.7	34.3	6.9	21.1	6.0	...	40—40
																			40—40
2	24.4	9.3	4.1	2.3	7.4	20.5	4.2	28.0	.....	.....	12.5	6.4	4.2	.....	6.7	...	.....	.....	45
																			41

PRODELPHINUS ATTENUATUS.

[redacted]

[1] Least.

382a	Brit. Mus.	*D. doris*			39.3	33.5	9.4	5.0	2.8	7.4	20.3	4.1	26.9	28.7	16.4	13.1	7.1	5.3	33.9	6.3	19.2	6.1		38—34 34—34
22, 12, 69 1.	Liverpool Pub. Mus*.				40.6	21.8	8.9	4.4	2.5		20.3		26.9		16.5	13.1	7.0	5.1						36—36 34—36
	....do				41.3	24.8	8.6	4.1	3.6		21.6		29.2		15.2	12.7	6.1		34.9					?37—?41 37—39
Walker's, No. 3.	Liverpool Pub. Mus.	*P. punctatus.*	Cape Verde Ids		38.5	23.3	8.3	4.1	2.3		20.3		26.4		15.2	11.9			32.2	6.6				42—42 41—40
	....do				38.1	21.6	8.9	4.8	2.9		18.4		25.0		16.3	12.4	7.3	5.8	31.1	..				38—38 33—33
126	Roy. Vic. Hosp'l at Netley.		Atlantic	Ad.	38.8	22.6	[1]9.0	5.1	2.8	7.1	19.0	3.9	25.4	26.9	18.2	13.1	6.6	5.3	33.4	[3]5.8	18 0	6.1		35—33 32—32
a3036	Mus. d'Hist. nat.				[2]40.6	25.2	[1]8.7	4.2	2.3	7.0	20.6	5.1	29.4	23.5	15.8	11.2	6.9	5.0						?44—?45 ?—?—
a3029	....do		Indian Ocean		41.3	25.2	[1]8.7	4.2	2.3	6.6	21.9	3.7	29.5	31.0	15.4	12.8	5.8	5.0	34.9	7.9	..	5.6		?42—?41 37—38
a3030	....do				41.7	25.7	[1]9.2	4.1	2.2	6.7	22.1	4.5	29.5		16.0	13.0	6.0	5.0	35.0	8.0	..	6.1		40—39 39—38
a3039	....do				41.3	25.4	[1]8.7	4.3	2.2	6.6	22.4	3.7	29.2	31.0	15.8	11.7	6.6	5.1	34.9	7.9		5.6		44—44 43—44
a3038	....do				40.9	24.9	[1]8.7	4.3	2.3	6.6	21.4	4.6	29.2	30.0	15.5	12.5	6.6	4.6	33.8	7.6		6.0		?41—?40 41—40
a3032	....do			Jr.	36.2	20.3	[1]8.5	4.3	2.3	6.6	17.8	3.6	24.2		15.3	12.6	6.6	4.6	30.5		..	5.9		37—37 37—37
a3027	....do		Madagascar		38.8	23.1	8.7	4.5	2.5	6.3	19.7	4.2	26.9	28.0	15.4	12.2	6.3	4.3						42—43 ?—?—
a3040	....do				41.3	25.4	8.7	4.1	2.3	6.9	21.9	..	30.0	30.7	15.0	12.5	6.3	4.8						39—38 ?—?—
a3031	....do		Parages de S t. Hélène.		38.6	22.6	8.7	4.8	2.6	6.9	19.1	3.8	25.4	27.0	16.2		6.9	5.3	32.4	5.3		5.8		37—38 36—35
a3056	.. do		Indian Ocean		42.2	26.4	8.4	4.1	2.0	6.6	23.1	4.0	30.7	32.0	16.0	12.2	6.7	4.8	36.1	8.4		6.1		41—42 42—41
a3034	.. do	*P. frœnatus.*	Cape Verde		37.5	21.4	8.7	4.7	2.6	7.1	18.6	3.7	24.0	27.2	15.3	12.4	6.9	4.3	31.8	5.9		6.1		36—37 34—35
a3033	....do	.. do	do	..	37.6	21.8	8.9	5.2	2.7	7.3	18.9	3.8	25.7	28.9	16.4	12.7	7.1	5.0	32.0	5.9	..	6.3		37—38 36—35
a3035	... do	*P. frontalis*	....do		39.1	22.6	9.2	4.6	2.3	7.5	19.8	4.0	26.4	29.2	15.8	12.2	6.9	4.8	33.5	6.3		6.0		38—37 37—36

* From Mr. Tyerman. [1] Least. [2] Greatest. [3] The beak is somewhat damaged at the tip.

Table of measurements—Continued.

PRODELPHINUS FRENATUS—Continued.

	Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of maxillary notches.	Breadth of beak— At ila middle.	Breadth of internaxillæ at middle of beak.	Greatest breadth between outer margins of internaxillæ proximally.	Length of tooth-line.	Last tooth to base of maxillary notches.	Extremity of beak to— Anterior margin of superior nares.	Extremity of beak to— End of crest of pterygoid.	Broadth between— Orbita.	Broadth between— Hinder margin of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Number of teeth.
		Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
.....	....	43.1	26.6	8.8	4.3	....	.....	....	....	.....	.....	15.9	....	6.8	.....	7.7	....	....	....	41— 41
.....	....	40.4	24.3	8.6	4.0	....	.....	....	....	.....	.....	16.0	....	6.6	.....	7.1	....	....	....	38— 38
.....	....	35.1	19.7	8.4	4.6	....	.....	....	....	.....	.....	15.1	....	7.0	.....	4.7	....	....	....	34— 34
.....	....	37.7	21.2	9.0	5.3	....	.....	....	....	.....	.....	16.2	....	6.7	.....	4.8	....	....	....	732— 738
.....	Ad.	38.3	22.6	8.3	4.8	2.5	6.3	19.6	3.6	26.1	.....	14.8	12.7	6.6	5.3	31.9	5.8	18.4	6.1	37— 38
.....	....	40.3	24.7	8.9	3.8	2.2	7.0	20.9	3.8	28.1	29.8	15.7	12.3	6.3	5.2	34.3	....	20.6	5.7	37— 36
.....	....	40.0	24.4	8.8	4.1	2.5	6.3	20.3	4.9	28.7	30.0	15.2	11.9	7.0	4.4	33.6	....	20.0	5.7	40— 40
.....	....	38.1	22.8	11.4	3.8	2.2	6.0	19.2	4.8	10.6	.....	14.6	12.8	5.7	4.4	31.4	6.6	19.2	5.2	?— 36 39— 39
.....	....	39.8	23.9	8.9	3.8	2.2	7.0	20.0	4.8	28.2	29.2	15.4	12.5	5.0	4.3	34.3	7.1	20.3	5.7	38— 39 40— 7
.....	....	39.6	22.8	8.8	4.6	2.5	7.3	20.0	3.5	28.5	27.3	16.8	12.8	6.6	4.4	33.1	5.4	19.5	6.5	40— 39 37— 36
.....	....	42.2	24.4	9.2	5.1	2.5	7.6	21.2	3.8	30.5	28.2	16.5	13.9	7.0	4.4	35.5	6.3	20.6	5.8	35— 36 35+—38
.....	....	39.1	23.9	8.9	5.3	2.5	6.9	19.7	4.8	27.3	29.5	16.2	13.3	4.7	3.6	....	....	....	....	35 —37 37— 40 ?—?—

PRODELPHINUS LONGIROSTRIS (Gray).

Delphinus longirostris, Gray, Spic. Zool., 1828, p. 1.
Delphinus microps, Gray, Zool. Ere. & Terr., 1846, p. 42, pl. 25.
Delphinus alope, Gray, Cat. Cet. Brit. Mus., 1850, p. 118.
Delphinus stenorhynchus, Gray, Cat. Seals and Whales, 1866, p. 396.

This species is distinguishable from those of the same genus, which we have already considered, by the small size of the cranium as compared with the beak. In the *Characters and Divisions*, Professor Flower places the four names given in the foregoing synonymy in one of his sections of *Clymenia*. In the *List* he unites *stenorhynchus* with *longirostris*, and holds *alope* and *microps* as distinct species. Of the latter, however, he remarks that it is "probably the same as the next (*P. longirostris*)."

To the union of *stenorhynchus* and *longirostris* I subscribe with little hesitation. Furthermore, the specific identity of *stenorhynchus* and *microps* does not appear to me very doubtful. The type of *microps* is, however, somewhat smaller than the type of *stenorhynchus*, though both skulls seem to be of the same age. The intermaxillæ are a little narrowed in front of the "triangle" in the former species but not in the latter. The beak is relatively longest and narrowest in *stenorhynchus*. On the other hand, in the remaining proportions the two skulls are alike, and the teeth are equally numerous and similar in form; the pterygoid bones are alike in form, having flat sides and a very sharp keel. The difference in the proportional width of the intermaxillæ at the middle of the beak is due to the partial absorption of these bones in *P. stenorhynchus*.

The coronoid process of the mandible is strongly developed in both skulls. The roots of the teeth in *P. stenorhynchus* are flattened, a little thickened, and imperforate.

If *Delphinus alope* is to be kept separate it must be because of its relatively broader beak and keeled mandibular symphysis. There is, however, in the collection of the National Museum, a skull, No. 21168, which is intermediate in form between *alope* and *longirostris*, and binds these two species together. The beak is broader than in *longirostris* or *microps* but narrower than in *alope*, and the symphysis mandibuli is more strongly keeled than in the two former species, but less than in *alope*. The skull is nearly as large as that of *stenorhynchus* (see table of measurements, page 76).

The specimens described by Dr. Lütken in his recent work,* under the name of "*Prodelphinus alope*," are certainly not the *Delphinus alope* of Gray (=*P. longirostris* Gray). On the other hand, the skeleton described as "*P. longirostris* (Schl.)" does, I believe, belong to the species under consideration.

* Lütken, K. Danske Vidensk. Selsk., Skr., 6th Raekke, v, pt. 1, 1889, pp. 43–47.

The description given by Dr. Lütken * applies almost equally well to a skeleton recently collected by the naturalists of the U. S. Fish Commission Steamer *Albatross*, in the Pacific Ocean, between the Galapagos Islands and Panama. The vertebral formula in each is as follows:

Dr. Lütken's specimen.....C. 7; D. 14; L. 17; Ca. 34=72
U. S. Nat. Mus., No. 23302.....C. 7; D. 14; L. 18; Ca. 34=75

The relations of the processes and foramina of the vertebræ are as follows:

	Dr. Lütken's specimen.	U. S. Nat. Mus., No. 23302.
First foramen perforans on vertebra number.....	48–49	48–49
Last distinct transverse process on vertebra number.	55	56
Last neural spine on vertebra number.....	61	62
Vertebræ without zygopophyses .....11(=31–41)		10(=32–41)

The length of the pectoral fin in the specimen in the National Museum is 256^{mm}. The formula of the phalanges is as follows: I, 2; II, 9; III, 7; IV, 3; V, 0.

The entire skin of this individual was not preserved, but the fins and a piece of skin from the side of the body were received with the skeleton. From these it appears that the dolphin was dark slate-gray above and white below. The darker color, which extends on to the fins, is everywhere mottled with very small blotches of a lighter gray. The white parts appear to have been covered with small streaks and stellate blotches of gray. Measurements of the skull will be found in the following table.

Table of measurements.

PRODELPHINUS LONGIROSTRIS.

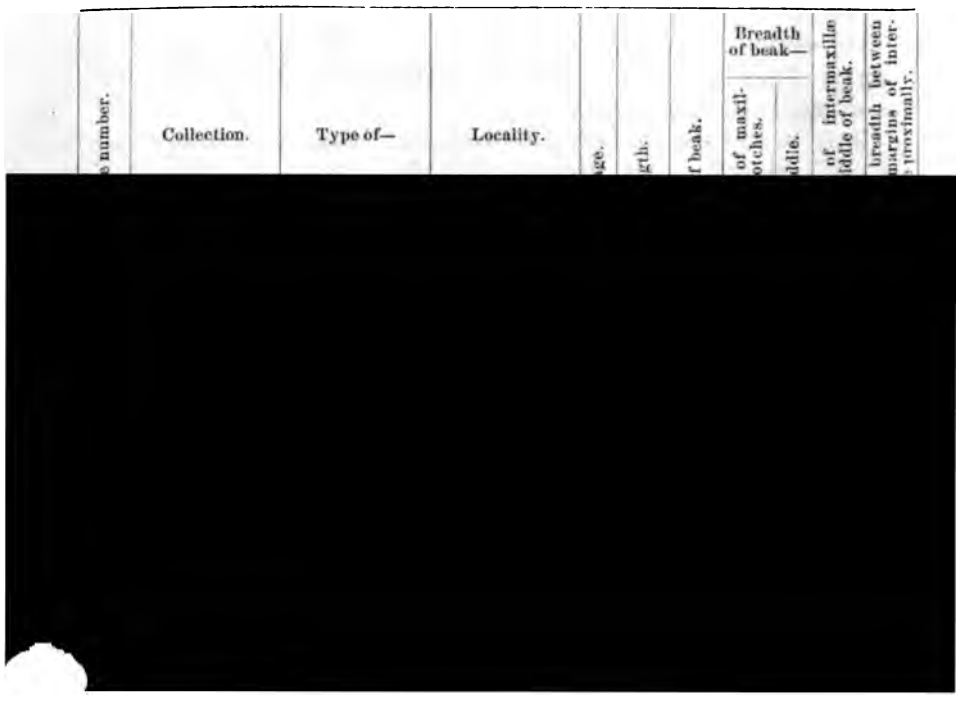


Table of measurements—Continued.

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
349a	22.8	3 6	29.2	30.5	13.0	11.7	4.7	3.7	34.3	5.6	21.7	5.6	0.24	53—55 52—51
1471a	25.2	5.2	33.6	35.2	14.7	12.3	5.3	4.2	39.7	6.3	26.7	1.9	0.25	53—56 53—56
8475*	23.1	3.8	30.9	31.7	15.4	12.8	5.6	4.1	36.0	6.1	23.4	5.	0.19	55—55 49—51
n. n.	.....	.....	.....	.....	14.6	13.1	5.6	4.2	37.5	7.6	....		....	48—48 49—49
a567	25.8	.....	33.0	34.4	15.0	12.8	5.4	4.3			.....		.....	?56—?5 ?54—? 3
3639	24.1	4.0	32.2	29.8	14.0	12.1	5.3	4.1	36.	4.8	23.5	5.4	.....	50—51 51—51
12	24.5	4.0	31.8	32.6	14.0	?12.8	5.0	4.0	37.	?6 8	.....	5.7	.....	?55—? 5 54—52
14	24.0	4.0	31.0	32.2	?14.2	?12.8	4.2	3.8	35.	6.5	.....	5.8	..	?55 — 53 —
21168	24.9	4.3	32.2	33.6	14.4	13.9	4.3	3.45	37.5	.....	23.8	6.0	0.3	49—47 46—47
22302	21.7	4.0	29.0	30.1	14.3	13.0	5.05	3.8	33.5	5.0	21.7	5.9	0.3	47—47 48—46

* Labeled *Clymenia alope*.

6. TURSIO Wagler.

Tursio, Wagler, Nat. Syst. Amphib., 1830, p. 34.
Leucorhamphus, Lilljeborg, Upsala Univ. Årsskrift, 1861, p. 5.

Professor Flower (*List*, p. 497) is inclined to believe that the finless dolphins on which this genus is erected may prove to belong to *Prodelphinus*. Until the skeleton is obtained it will be impossible to decide whether this view is correct or otherwise. The skull in the National Museum (No. 8160, obtained by Mr. Dall), however, which is known to be that of a finless dolphin, presents certain characters which make it probable that this genus has claims to recognition equally with *Lagenorhynchus*, *Prodelphinus*, and other genera of the family.

In the skulls in the College of Surgeons, London, and the National Museum, respectively, and in that figured in the *Ostéographie* (Pl. XXXVIII, figs. 3 and 3*a*) the pterygoids are apart at their base, and, except in the first mentioned, throughout their entire length. In an adult skull in the Berlin Museum from Yeddo, Japan, collected by Dr. Hilgendorf, the pterygoids are long and are not in contact distally. If, when more specimens have been accumulated, this character is found

to hold good, it will aid in distinguishing this genus from *Lagenorhynchus*, *Prodelphinus*, *Tursiops*, and *Delphinus*, its nearest allies.

In the skull in the National Museum the free margins of the maxillæ behind the notch are thinned out as in *Sagmatias*. I neglected to note this character in the skull in the College of Surgeons, and Van Beneden and Gervais figure only the lower side of their specimen.

The mandible of our specimen is remarkable for its extreme attenuation anteriorly. It is bent downward and is not keeled anteriorly. In Cuvier's figure of *L. peronii* the mandible is bent downward, but is distinctly keeled (*Oss. fossiles*, 4th ed., pl. 222, figs. 5–6).

The scapula of *L. peronii*, figured by Cuvier (*Oss. foss.*, 4th ed., pl. 224, fig. 20), is, as pointed out, remarkable for its width as compared with its height. The acromion and coracoid are also very large.

The genus may be provisionally defined as follows: No dorsal fin. Pterygoids apart in the median line, at least at the base. Maxillæ not thickened behind the notch.

Two species are tolerably well known, the one, *L. peronii*, from the South seas, and the other, *L. borealis*, from the North Pacific. They may be distinguished by their coloration, as follows:

1. Beak and pectoral fins white ..... *L. peronii*
2. Beak and pectoral fins dark, like the back ..... *L. borealis*

TURSIO PERONII (Lacépède).

Delphinus peronii, Lacépède, Hist. nat. des Cétacés, 1804, p. 316.
Delphinus leucorhamphus Peron (MS.), *fide* Lacépède, Hist. nat. des Cétacés, 1804, p. 316.
Leucorhamphus peronii, Lilljeborg, Upsala Univ. Årsskrift, 1861, p. 5.

Neither Lacépède nor Desmarest (Mammalogie, p. 517) seems to have suspected that Peron's *Dauphin leucorhamphe* was without dorsal fin, but Cuvier,* having obtained a skin from India through Dussumier, in which the dorsal was absent, while the colors corresponded to those of Peron's dolphin, concludes that the latter was finless. He identifies his specimen with the *D. peronii* of Lacépède.

Very few specimens of this species have been preserved. The skull figured by Van Beneden and Gervais (Ostéog. pl. 38, fig. 3) is presumably that received by Cuvier from Captain Houssard,† though these authors do not state that it is the same. I unfortunately failed to see this specimen when in Paris. Gray (Cat. Seals and Whales, p. 277) gives measurements of a skull in the same museum "from Peron," but I think that there must be some mistake regarding this statement. There is a skull (No. 3029) in the College of Surgeons, London, which Professor Flower has identified with this species. The four skulls (Nos. 17, 18, 19, 20) in the Leyden Museum, which are labeled *D. peronii*, do not

* Recherches sur les Ossemens fossiles, 4me éd., viii, pt. 2, 1836, p. 107.
† F. Cuvier has *Houssart* (Hist. nat. Cétacés, p. 165).

seem to me to belong to this species. One of them (No. 20) is apparently that mentioned by Schlegel under this species in the *Abhandlungen* (Heft 1, p. 24). It most resembles *Prodelphinus frœnatus*.

Judging from an authentic skull of *L. borealis* in the National Museum (presently to be described), I believe that there can be no reason to doubt the correctness of Professor Flower's identification of skull No. 3029 in the College of Surgeons. It is from Tasmania. The total length is 44^{cm}. The triangular area in front of the nares is but slightly concave. The intermaxillæ, which are much depressed, do not touch in the median line; they are farthest apart at the distal extremity. The central portion of the symphysis below is raised above the level of the lower surface of the rami. The coronoid is high. The pterygoids, as already stated, touch only at the tip. The palate is convex.

All these characters are presented by the skull of *L. borealis* and are, therefore, of no moment in distinguishing the two species. Indeed, I am at a loss to find cranial characters by which to distinguish them, since the proportions of the two skulls (see p. 82) are on the whole very much the same. In the skull of *L. peronii*, however, the temporal fossæ are relatively smaller, the mandible is shorter, its depth opposite the coronoid process is less, and it is less attenuated at the extremity. The right intermaxillary bone in our skull of *L. borealis* ends proximally opposite the *middle* of the nares, instead of running back to the posterior wall, but this is very probably an individual variation.

The skull figured in the *Ostéographie* is also much like that of *L. borealis* from California, but we know that the former is from south of the equator, while, so far as I am aware, no porpoise having the coloration of *L. borealis* has been observed in southern waters. It would appear, therefore, that the two species are closely alike in cranial characteristics, but widely dissimilar in coloration.

The figures of *L. peronii* given by D'Orbigny and Gervais (specimens from Cape Horn) and Gray (specimens from midway between Cape Horn and New Zealand) agree very closely, the chief difference being that in the former the pectoral fin is represented as dark in the center of the posterior margin.

Lesson's figure (Voyage of the *Coquille*, pl. 9, fig. 1) represents a dolphin with white flukes and an elongated beak, which characters are also mentioned in the text.*

This may be a distinct species, though it is more than probable that the figure is inaccurate. The measurements of the exterior given by Lesson † differ much from those which I find in the notes upon *L. bore-*

* Zoology, Voyage of the *Coquille*, 1, pt. 1, p. 180. † *L. c.*

alis which Mr. Dall has kindly placed at my disposal. In the following table are given both series of measurements, reduced to centimeters:*

Measurements.	L. peronii. From Lesson.	L. borealis. From Mr. Dall's notes. 8100 ♂. 200 miles off Cape Mendocino, Cal.
	Centimeters.	*Centimeters.*
Total length	184.1	246.4
Circumference opposite the genitals	64.0	53.3
Circumference of the head at the eyes	73.1	57.2
Length of the tail	43.3	40.6
Length from extremity of snout to pectoral	59.5	63.5
Length from angle of mouth to eye	5.4	9.5
Length from eye to pectoral	25.7	30.5
Length of the pectoral	31.1	30.5
Length from extremity of snout to corner of mouth	27.1	24.8
Length of the tail*	14.9	.....
Length of the penis	21.7	.....
Length of the eye	2.7	.....
Length from anus to extremity of tail	44.7	57.2
Length of the anus	1.8	.....

* I understand this to be the antero-posterior length of either fluke. The fourth measurement is the width between the extremities of the flukes.

It appears that Lesson's specimen was much stouter than the *L. borealis* observed by Mr. Dall, and had wider flukes and longer pectoral fins and mouth. Mr. Dall's sketch of his specimens shows these characters. It represents a dolphin more slender than even that figured by D'Orbigny and Gervais; and while, in all the figures of the southern forms the snout and pectoral fins at least are white, in Mr. Dall's figure the black color extends to all parts of the body except an area on the belly and a small space on the under side of the lower jaw.

There is a painted skin of this species (No. 6086) in the Zoological Museum of Berlin. The beak and pectoral fins are painted white, and the same color extends upon the upper anterior margin of the flukes.

That there are two distinct species of right-whale porpoises can not, I think, be doubted.

Dall's figure the central portion of the under side of the flukes is white. It should be remembered that the individual which Peale sketched was probably young, being only about 4 feet long. Mr. Dall's specimen was a male 8 feet 1 inch long.

Scammon also figures this species in his Marine Mammalia (Pl. XIX, fig. 3). He gives the colors as in Mr. Dall's sketch, but makes the form much more robust and the head high like that of a young *Hyperoodon*. We have no means of knowing whether this figure was made from memory or from a captured specimen of the species.

The general color of the specimens obtained by Dr. Hilgendorf, in Yeddo, Japan, was black. On the belly is a white area, which in the young individual begins on a line with the eye, but in the adult extends farther forward and ends on a bluish fork, which goes to the corner of the mouth. The anterior third of the lower jaw is whitish violet, and the margin of the lower lip is black.

The following measurements were taken by Mr. Dall. A part of them, reduced to centimeters, have already been given in comparison with Lesson's measurements of *L. peronii* on page 80.

Measurements of Tursio borealis (Peale), male, taken 200 miles off Cape Mendocino, California, October, 1868.

	Inches.
Length over all	97.0
Extremity of snout to angle of mouth	9.75
Extremity of snout to eye	13.0
Extremity of snout to blowhole	14.0
Extremity of snout to anterior edge of pectoral fin	25.0
Extremity of snout to posterior edge of pectoral fin	28.5
Angle of mouth to eye	3.75
Height of eye above line of mouth	0.75
Length of anterior edge of pectoral fin	12.0
Length of posterior edge of pectoral fin, from base to angle	3.5
Length of posterior edge of pectoral fin, from angle to tip	5.5
Width of pectoral fin at base	4.0
Width of pectoral fin from posterior angle to middle of anterior margin	3.5
Length of beak	2.5
Length of portion of lower jaw protruding beyond upper	0.5
Breadth across the flukes	16.0
Antero-posterior length of either fluke	6.0
Distance from median notch to extremity of either fluke	10.25
Distance from median notch to the ending of the superior margin or keel of the tail	2.0
Height of the caudal peduncle at insertion of flukes	3.75
Diameter (from side to side) at same point	1.5
Distance from notch of flukes to anus	22.5
Length of anus	1.0
Length of genital slit	6.0
Distance from notch of flukes to genital slit	27.5
Length of penis	15.0
Girth of head at eyes	26.5
Distance around head from eye to eye below	12.5
Distance between pectoral fins	12.0

	Inches.
Width across the mouth at the angles	9.0
Girth of body at insertion of flukes	7.0
Girth of body at anus	15.5
Girth of body at genital slit	21.0
Girth of body at a distance of 4 feet from flukes	33.0
Girth of body behind the pectoral fins	36.0
Girth of body in front of the pectoral fins	34.0

Scammon states that he has seen this species as far south as San Diego Bay, California, and as far north as Bering Sea.

The differences in color and proportions between this species and *L. peronii* are so great that we may expect to find differences in the skeletons when the latter become known. The skulls, however, as already stated, show few differences. I have already referred to the shortness of the right intermaxillary bone, and it may be that this is a character peculiar to *L. borealis*. In Cuvier's figure of *L. peronii* the proximal end of the right intermaxilla is in the normal position.

TURSIO BOREALIS AND PERONII.

Table of measurements.

Catalogue number.	Species.	Collection.	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillary at middle of beak.	Greatest breadth between outer margins of intermaxillary proximally.
							At base of maxillary noteches.	At its middle.		
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
3029	*Tursio peronii*	R. Col. Surg	Tasmania	...	44.0	24.7	11.2	6.1	3.6	8.1
	....do	[From Cuvier, Oss. foss.]	.....	...	42.6	24.2	11.1	6.2	.....	.....
8160	*Tursio borealis*	U.S. Nat. Mus.	200 miles off Cape Mendocino, Cal.	♂	43.7	24	11.0	5.6	3.1	7.8

7. LAGENORHYNCHUS Gray.

=*Lagenorhynchus*, Gray, Zoology of the Erebus and Terror, 1846, p. 34.
<*Delphinus* of authors prior to 1846.
>*Electra*, Gray, Suppl. Cat. Seals and Whales, 1871, p. 76.
>*Leucopleurus*, Gray, Suppl. Cat. Seals and Whales, 1871, p. 78.
>*Lagenorhynchus*, Gray, Suppl. Cat. Seals and Whales, 1871, p. 79.

Professor Flower, in his recent admirable review of the family *Delphinidæ*, gives the following diagnosis of the genus *Lagenorhynchus*:*

Rostrum scarcely exceeding the length of the cranium; broad at the base and gradually tapering toward the apex; depressed. Pterygoid bones normal, meeting in the middle line. Teeth small, not exceeding 4^{mm} in diameter, $\frac{23}{23}$ to $\frac{33}{33}$. Vertebræ very numerous, 80 to 90. Spinous and transverse processes of the lumbar vertebræ very long and slender; bodies short. Externally, head with a short but not very distinct beak.

In the course of my studies upon the genus I have found no cause to take exception to this diagnosis, except so far as the number of teeth and vertebræ are concerned. If the opinion that the *Lagenorhynchus thicolea* of Gray belongs to this genus is correct, the maximum number of teeth must be set down as $\frac{42}{42}$, or $\frac{45}{45}$, instead of $\frac{33}{33}$. On another page I have shown that *Lagenorhynchus obliquidens*, Gill, has but 74 to 76 vertebræ.

In addition to the characters summed up by Professor Flower, I have observed that the mandibular foramina in this genus are usually more crowded together at the symphysis than in *Prodelphinus* and *Delphinus*, and are not preceded by so deep canals. The presence of an area of bright color rather high up on the side, between the dorsal fin and the flukes, likewise appears to be characteristic of the genus.

The genus is, unquestionably, very closely allied to *Prodelphinus*. The teeth are, *on the whole*, more numerous, and the vertebræ less numerous in the latter genus, but some species of *Prodelphinus* have a less number of teeth and a greater number of vertebræ than some species of *Lagenorhynchus*, and *vice versa*. The proportional length of the beak, the breadth and flatness of the intermaxillæ, appear to be the chief cranial distinguishing characters which can be brought forward at present.

The number of species which have been assigned to this genus is quite large. In the following lists are included: (1) The species which appear to me valid and as properly belonging in the genus, and their synonyms; (2) species referred to the genus by previous writers, but which I regard as belonging elsewhere; (3) nominal species.

1. VALID SPECIES AND THEIR SYNONYMS.

1. *Lagenorhynchus acutus* Gray. 1828.
Syn. *Delphinus eschrichtii* Schlegel. 1841.
Delphinus leucopleurus Rasch. 1843.
Lagenorhynchus perspicillatus Cope. 1876.
Lagenorhynchus gubernator Cope. 1876.

* Proc. Zool. Soc. London, 1883, p. 511.

2. *Lagenorhynchus fitzroyi* Waterhouse. 1840.
3. *Lagenorhynchus albirostris* Gray. 1846.
4. *Lagenorhynchus electra* Gray. 1846.
   Syn. *Lagenorhynchus asia* Gray. 1846.
   Phocæna pectoralis Peale. 1848.
   Delphinus fusiformis Owen. 1866.
5. *Lagenorhynchus cruciger* d'Orbigny and Gervais. 1847.
   Syn. *Lagenorhynchus clanculus* Gray. 1849.
   Lagenorhynchus latifrons (Paris Museum).
6. *Lagenorhynchus thicolea* Gray. 1849.
   Syn. *Lagenorhynchus breviceps* of Wagner.
7. *Lagenorhynchus obliquidens* Gill. 1865.
8. *Lagenorhynchus superciliosus* Schlegel. 1841.

2. Species Transferred to the Genus by Previous Writers, but which I regard as belonging elsewhere.

Lagenorhynchus lateralis of Cassin. Upon *Delphinus lateralis*, Peale.
Lagenorhynchus cæruleo-albus of Gray. Upon *Delphinus cæruleo albus*, Meyen.
? Lagenorhynchus albirostratus of Dall. From a skull supposed to be identical with *Delphinus albirostratus*, Peale.
Lagenorhynchus de Castelnau of Van Beneden.

3. Nominal Species, Undescribed, or Described only from Individuals Seen at a Distance.

Delphinus cruciger Quoy and Gaimard.
Delphinus albigenus Quoy and Gaimard.
Delphinus bivittata Lesson and Garnot.

SPECIES INCORRECTLY REFERRED TO THE GENUS.

1. *Lagenorhynchus lateralis* Cassin.

Upon *Delphinus lateralis* Peale. U. S. Explor. Exped., VIII, Mamm. & Ornith., 1848, p. 35, Pl. VIII, fig. 1.

Cassin assigns this species to Gray's genus *Lagenorhynchus* without giving any reason for so doing. He states that he was unable to "find any specimen in the collection of the expedition."* I have been equally unsuccessful in finding any traces of it. The species must, therefore, be judged by Peale's figure and description.

The figure in question represents a dolphin having a long beak, such as exists in *Delphinus* and *Prodelphinus*, and which does not at all resemble the short plowshare-like beak of *Lagenorhynchus*. Again, the style of coloration is more like that which obtains in *Delphinus* or *Prodelphinus* than that of *Lagenorhynchus*. Finally, the teeth exceed the number usual in *Lagenorhynchus*, viz, $\frac{41}{41}$.

For these reasons, taken together, I should exclude the species from *Lagenorhynchus*. It will be impossible to say whether it is a *Delphinus* or *Prodelphinus*, unless more external characters distinguishing those genera are brought forward. On the whole, however, it seems to me most probable that Peale's dolphin belongs to *Prodelphinus* and is closely allied to *P. marginatus* (Duvernoy).

* Cassin, U. S. Explor. Exped., Mamm. and Ornith., 1858, p. 33.

2. *Lagenorhynchus caruleo-albus* Gray.

Founded on *Delphinus caruleo-albus*, Meyers.

I reject this species on account of the shape of its head and the coloration, which seem to me characteristic of *Prodelphinus*. The type skull is that of a *Prodelphinus*. (See page 62.)

3. *Lagenorhynchus albirostratus* (?) Dall.

Scammon's Marine Mammalia, 1874, Appendix, p. 293.

Mr. Dall refers to the *Delphinus albirostratus* of Peale (which he assigns to the genus *Lagenorhynchus*), a skull obtained by Captain Marston in the Pacific. He does so apparently because Captain Marston's description of the exterior of the individuals of the school from which the specimen in question was obtained seemed to him to agree with the description of Peale's *D. albirostratus*. I am inclined to believe, however, after studying the measurements of the skull, that Captain Marston's specimen should be referred to *Prodelphins doris*. Whether *D. albirostratus*, Peale, should also be referred to that species must always be more or less uncertain, because it is only known from the exterior. Whatever decision may be finally reached regarding that species, it seems to me best for the present to refer Mr. Dall's specimen to *Prodelphins* rather than to *Lagenorhynchus*.

4. *Lagenorhynchus de Castelnau* Van Beneden.

Bull. de l'Acad. R. Belgique, 2me sér., XXXVI, 1873, p. 38, fig. 2.

This name has been applied by Professor Van Beneden to a figure of a young dolphin, executed by the Comte de Castelnau. From the fact that the name was not given in Latin form it is evident that it was not intended as a formal scientific appellation, but simply as a common name, *i. e.*, Castelnau's Lagenorhynchus.

Judging from the form of the head and the coloration I am inclined to believe that the figure represents a young *Delphinus delphis*, and I shall therefore omit further reference to it.

REVIEW OF THE VALID SPECIES OF LAGENORHYNCHUS.

LAGENORHYNCHUS ACUTUS Gray.

Delphinus acutus, Gray, Spic. Zool., 1828, p. 2.
Lagenorhynchus acutus, Gray, Zool. Erebus and Terror, 1846, pl. XII.
Delphinus eschrichtii, Schlegel, Abh. Gebiete Zool., etc., 1841, p. 23.
Delphinus leucopleurus, Rasch, Nyt Mag. for Naturvidens., IV, 1843, p. 97, pls. 2, 3.
Leucopleurus arcticus, Gray, Synopsis Whales and Dolphins, 1868, p. 7.
Lagenorhynchus perspicillatus, Cope, Proc. Acad. Nat. Sci. Philadelphia, 1876, p. 136.
Lagenorhynchus gubernator, Cope, Proc. Acad. Nat. Sci. Philadelphia, 1876, p. 138, pl. IV.

It is much to be regretted that the type of Gray's *D. acutus* is lost, as Professor Flower's painstaking investigation seems to prove it to be.

The original description is far from satisfactory, and, indeed, applies equally well to several other species of the genus. Since, however, Gray expanded his description in later publications so that it is plain to what species he referred, it seems best on the whole to retain the name which has secured a footing in the literature rather than to displace it by Schlegel's *D. eschrichtii*, published many years later.

I am unable to enter into the question of the identity of Schlegel's *D. eschrichtii* and Rasch's *D. leucopleurus*, since I saw the type-skeleton of neither. Professor Flower does not state that he saw the type of the former himself, but simply that it "is still to be seen in the Leyden Museum." He is convinced, however, of the identity of the two species. If such be the truth (I do not presume to appeal from Professor Flower's decision), the statement of the number of vertebræ in Schlegel's description must be incorrect. The formula derived from his description would be as follows: C. 7; D. 15; L. 32; Ca. 37 = 91. This number corresponds more closely with that found in *L. albirostris* than with that found in *L. leucopleurus*. I shall use Gray's name, *L. acutus*, throughout this section as synonymous with *L. leucopleurus* and *L. eschrichtii*.

The *Lagenorhynchus perspicillatus* and *Lagenorhynchus gubernator* of Professor Cope I regard identical with *L. acutus*. *L. gubernator*, however, is founded on a young individual (as I have determined from an examination of the type-cast and a photograph of the individual from which the same was made), and may, therefore, be disregarded. The type-cast of *L. perspicillatus* agrees absolutely in color with Rasch's figure of *L. leucopleurus*, and the measurements also agree. The measurements of *L. perspicillatus* also agree very closely with those given by Duguid for *L. acutus*. Moreover, the measurements of the large series of skulls mentioned by Professor Cope, which is still in the Museum, agree with those of the type of *L. leucopleurus*, as will be seen by reference to the table on p. 87. I have also carefully compared one of the skeletons from Cape Cod, referred to by Professor Cope, with a skeleton of *L. acutus* from the Faröe Islands, which was lent me for study by Dr. J. S. Billings, Director of the U. S. Army Medical Museum, and can find absolutely no differences but such as are referable to individual variation. The figure accompanying Professor Cope's paper (Proc. Acad. Nat. Sci. Phila., 1876, pl. IV), though styled *Lagenorhynchus perspicillatus*, is really that of one of the casts of the young *L. gubernator*. It agrees exactly with the photograph in the Department of Mammals, and may be regarded as an excellent figure of a young *L. acutus*. The name *L. bombifrons*, alluded to by Professor Cope (l. c., p. 138), is a slip of the pen, *L. perspicillatus* being intended.

The distinctions between this species and the remaining members of the genus will be pointed out in treating of the latter.

Table of measurements.

LAGENORHYNCHUS ACUTUS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of maxillary notches.	Breadth of beak— At its middle.	Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
360*a*	Brit. Mus		Greenland	..	38.8	19.8	10.2	6.6	4.1	8.1
3026	R. Col. Surg		Drobäk, Norway	..	39.7	20.6	10.4	7.0	3.8	8.5
3025	do		Coast of Norway	..	40.6	20.9	11.1	7.3	4.4	8.2
22256	U. S. Nat. Mus.		Norway	..	38.9	19.6	10.2	6.4	3.8	8.4
14327	do		Cape Cod	..	41.7	21.4	11.2	6.9	3.8	8.4
14264	do		do	..	39.9	20.1	10.7	6.9	4.2	8.9
14—(?)	do		do	..	40.9	21.1	10.9	6.9	3.8	8.7
14281	do		do	..	41.4	21.1	11.7	7.9	4.8	8.7
14244	do		do	..	42.5	21.6	11.4	7.6	4.3	8.9
14260	do		do	..	41.4	20.8	11.4	7.3	4.1	8.4

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to— Anterior margin of superior nares.	Extremity of beak to— End of crest of pterygoid.	Breadth between— Orbits.	Breadth between— Hinder margins of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process of.	Transverse diameter of largest tooth.	Number of teeth.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*		
360*a*	17.4	3.0	25.2	26.7	19.8	17.8	7.8	4.6	.....	.....	.....	.....	.....	$\frac{35—34}{7—7}$
3026*	18.1	3.0	27.9	26.0	20.3	17.7	7.3	4.1	33.0	4.1	18.7	6.3	....	$\frac{40—37}{37—38}$
3025	16.5	5.4	27.9	26.3	21.2	17.9	7.9	4.4	33.6	4.4	16.5	6.6	.....	$\frac{—30}{—31}$
22256	17.3	3.3	23.9	27.2	19.8	18.0	6.9	4.3	32.3	.....	.....	6.4	0.4	$\frac{36—37}{37—37}$
14327	19.1	3.3	25.9	29.3	20.3	18.8	7.9	4.3	....	.....	.....	.....	....	$\frac{36—34}{—}$
14264	17.6	3.6	24.7	27.5	20.6	18.6	7.6	4.6	.....	.....	.....	...	0.4	$\frac{35—36}{—}$
14—(?)	19.1	3.3	25.5	27.8	21.1	18.1	7.1	4.3	.....	.....	.....	.....	.....	$\frac{35—35}{—}$
14281	18.6	3.6	26.0	29.0	22.4	19.6	7.9	4.1	.....	.....	.....	.....	.....	$\frac{37—37}{—}$
14244	18.6	3.6	26.2	29.1	21.6	18.3	8.4	4.3	.....	.....	.....	.....	.....	$\frac{35—35}{—}$
14260	18.6	3.0	26.7	29.3	21.6	18.0	7.6	4.6	....	.....	.....	.....	....	$\frac{37—38}{—}$

* One of Rasch's types of *L. leucopleurus*.

LAGENORHYNCHUS FITZROYI (Waterhouse).

***Delphinus Fitzroyi*, Waterhouse, Zoology of the Voyage of the Beagle, II, Mammalia, 1839, p. 25, pl. 10.**

***Lagenorhynchus Fitzroyi*, Flower, Proc. Zool. Soc. London, 1883, pp. 490 and 511.**

Regarding this species I can say nothing except to express my concurrence in Professor Flower's opinion, namely, that it is possibl

identical with *L. clanculus*. The type-specimen consists only of the beak (with the integuments) cut off close behind the last teeth. The length of the superior tooth row is 6.8 inches; width between the last upper teeth on opposite sides, 2.4 inches; length of tooth row of mandible, 6.6 inches; symphysis, 1.5 inches; depth of ramus at last tooth, 1.3 inches; width of elevated portion of the maxillary joining the palatines, 1.4 inches; teeth, $\frac{29-29}{28-27}$.

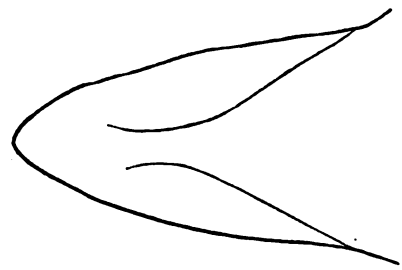


FIG. 1.

Fig. 1 represents the type specimen seen from above, reduced to a little more than two-fifths natural size.

I have carefully compared the measurements of the exterior given by Waterhouse with Duguid's measurements of *L. acutus*,* and with my own measurements of the type-cast of Professor Cope's *L. perspicillatus* but find no correspondence between them.

Compared with *L. perspicillatus* (which I regard as identical with *L. acutus*), Fitzroy's dolphin appears to have a smaller dorsal fin, situated farther from the extremity of the snout; and longer pectorals also relatively farther from the extremity of the snout. The shape of the head and the pattern of coloration seem to be very different.

This species cannot be properly studied until more specimens have been obtained.

wards relegated it to the section *Electra*, which he raised to generic rank. Professor Flower, in his recent admirable essay, seems first in doubt as to whether it should not be assigned to *Lagenorhynchus* (P. Z. S., 1883, p. 490), but later describes it in connection with the genus *Prodelphinus*, and finally places it in his tentative list of species of that genus (P. Z. S., 1883, pp. 496 and 512) near *P. obscurus*.

The considerations which lead me to assign this species to *Lagenorhynchus* are the same which influenced me in the case of *L. longidens* (p. 99), to which in fact the present species appears to be closely related. It differs from that species in that the beak is shorter and narrower, the intermaxillaries narrower, the temporal fossæ smaller and more oval. But it differs also especially from *L. longidens*, and indeed from all other species to which it can be approximated, in having about 42 teeth in each ramus of the mandible. The teeth in the upper jaw would appear to be 45–45, but their number can only be estimated on account of the imperfect condition of the skull.

The label states that this skull was derived from the west coast of North America, and was taken out of Dr. Dickie's collection. If the record is correct, it is somewhat singular that the species was not met with by Captain Scammon or Mr. Dall. There are no specimens in the national collection which can be assigned to it.

LAGENORHYNCHUS BREVICEPS Wagner.

A skull of this species is figured by Messrs. Van Beneden and Gervais,* under the name of *Lagenorhynchus breviceps*, but the authors do not state explicitly that it is the type of Hombron and Jacquinot, figured in the atlas of the voyage of the *Astrolabe*. That the two figures are not from the same specimen appears probable from the fact that the latter represents an entire skull, while the former represents one from which the top of the brain-case has been removed. In general appearance the two figures though much alike are not identical. Professor Flower has referred Messrs. Van Beneden and Gervais's figure to *Prodelphinus*.* Hombron and Jacquinot's figure of the exterior,† however, represents a dolphin having the contours and the coloration of a *Lagenorhynchus*, and the species must, I think, be referred to that genus. Whether it should be regarded as identical with *L. thicolea* is perhaps somewhat questionable, for while the skull figured in the atlas of the *Astrolabe* expedition agrees with the type-skull of *L. thicolea* the teeth are considerably more numerous in the latter. The original specimen of *D. breviceps* was from the Rio de la Plata.

It is to be observed, however, that the naturalists of the *Astrolabe* expedition state that they found only fragments of a skull, etc., in the collection. It is possible, therefore, that the skull which is figured as

*Ostéographie des Cétacés, pl. XXXVI, fig. 2.

* Proc. Zool. Soc., London, 1883, p. 496.

† Zool. Voyage Astrolabe et Zélée, atlas, pl. 22, fig. 1.

entire in the atlas of the *Astrolabe* expedition, was afterwards broken, and that it is this same skull which was figured by Messrs. Van Beneden and Gervais.

Table of measurements.

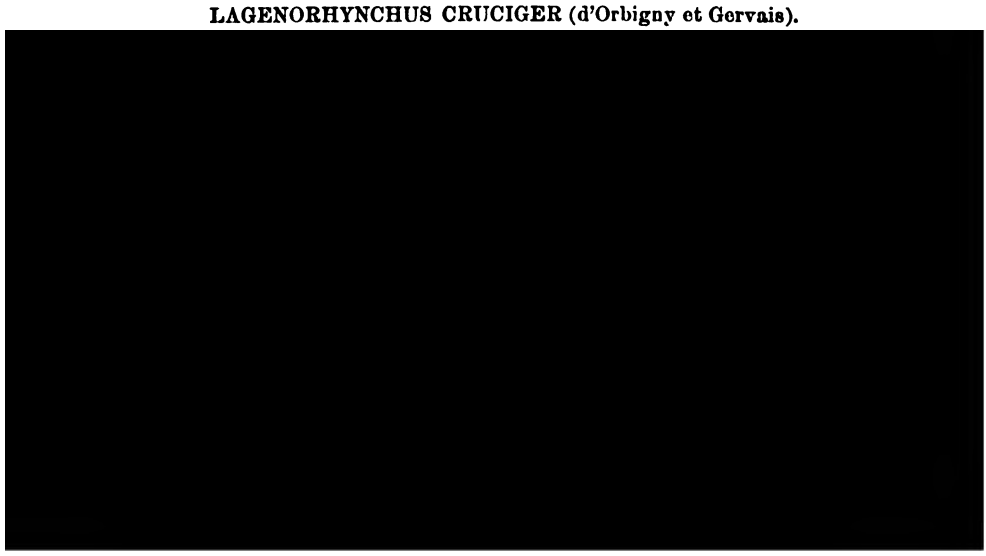
LAGENORHYNCHUS THICOLEA.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
							At base of maxillary notches.	At its middle.		
934*a*	Brit. Mus...	*L. thicolea*, Gray.	W coast North America.	.....	*Cm.* 37.5	*Cm.* [1]20.0	*Cm.* 9.7	*Cm.* 5.3	*Cm.* 2.8	*Cm.* 7.8

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
934*a*	17.3	3.7	23.7	.....	16.3	.....	5.6	4.1	31.1	3.0	18.1	6.1	0.25	$\frac{(45)-(45)^2}{42-42}$

[1] One centimeter should be added for breakage. [2] An estimate.

LAGENORHYNCHUS CRUCIGER (d'Orbigny et Gervais).



méridionale," under the name of *Delphinus cruciger* (and after close examination I find no reason to believe otherwise), there can be no doubt that this species is the same as the *L. clanculus* of Gray, described in 1849.

With these skulls must also be associated two other specimens, No. *a*3041, of the Paris Museum, labeled *L. latifrons* (a name which I have been unable to find in the literature), and No. 3027, of the Royal College of Surgeons.

In all these specimens the "triangle" is more or less elevated, and is flat and slightly or not at all rugose. The intermaxillæ are flat and nearly horizontal, and are not twisted into a vertical position at the distal extremity. The temporal fossæ are full ovals in the Paris specimens, but in the type of *L. clanculus* the anterior side is straight, so that the fossæ present the appearance of half ovals. The pterygoids are short but wide; they touch the median line. The normal dental formula is probably $\frac{28-28}{28-28}$, though the teeth in the specimens themselves present the variations in number common to all the toothed whales.

It has been the fashion, since the time of F. Cuvier at least, to seriously consider the identity of the *D. cruciger* of Quoy and Gaimard and the *D. bivittatus* of Lesson, species which were "*vus en mer et dessinés à distance.*" D'Orbigny fell into this error (though hesitatingly) in adopting Quoy and Gaimard's name for the animal which he captured and of which he sent the skull to Paris. He thereby produced confusion in the nomenclature. The misstep of the French explorers was not that they made drawings of animals which they only saw at a distance, but that they introduced them into their narrative under special scientific names. Considering that such names have no validity, I hold that d'Orbigny and Gervais's binomial is the proper one to apply to the species in question.

It is not to be denied, however, that much interest frequently attaches to such representations as have been referred to.

Malm, in his account of the specimens of Cetaceans in the Swedish Museums* describes a skeleton and skin of this species obtained by Captain Wärngre at Cape Horn.

The skull is a little smaller than that of the type of *L. cruciger*, but agrees with it perfectly in proportions (see table below). The vertebral formula is as follows: C. 7; D. 13; L. 22; Ca. 29; total 71. For a full account of this individual the reader is referred to Malm's original article.

* A. W. Malm, K. Svenska Vetens.-Akad. Handl., ny följd., IX, pt. 1, 1870, p. 68.

Table of measurements.

LAGENORHYNCHUS CRUCIGER.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of maxillary notches.	Breadth of beak— At its middle.	Breadth of intermaxille at middle of beak.	Greatest breadth between outer margins of intermaxille proximally.
					Cm	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
a 3045	Mus. d'Hist. nat.	*D. cruciger* d'Orb. & Gerv.	.....	....	34.9	17.8	10.7	6.6	4.1	8.7
935*a*	Brit. Mus.....	*D. clanculus*, Gray.	.....	....	34.9	17.6	10.4	6.4	3.3	7.8
a 3041	Mus. d'Hist. nat.	.....	.....	...	34.9	18.3	10.7	5.6	3.4	8.1
3027	R. Coll. Surg ..	.....	.....	....	.....	18.7	10.4	6.9	3.3	7.9
	Stockholm Mus.	(From Malm)	Cape Horn	....	33.8	17.8	10.5	.....	.....	.....

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to— Anterior margin of superior nares.	Extremity of beak to— End of crest of pterygoid.	Breadth between— Orbits.	Breadth between— Hinder margins of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*		
*a*3045	15.2	3.3	22.1	22.4	17.1	16.3	6.9	4.1	28.2	3.5	.....	6.6	....	{28—27 28—27
935*a*	15	3.6	21.9	22.6	17.4	16.2	6.9	3.4	29	3.3	15.8	7.1	0.23	{30—30 30—29
*a*3041	15.2	4.1	22.9	23.1	17.6	16.3	7.1	4.2	28.7	3.5	.....	6.9	....	{28—28 28—28
3027	16.1	3.2		23.1	17.7	23.8			29.1	3.8	16.2	6.6		{—29

garding the skeleton in question, Schlegel makes the following statements:

> That this species (*D. superciliosus*), moreover, occurs off the Cape of Good Hope appears from the observations of our late explorer, Dr. Van Horstok, who has sent us a complete skeleton of the species.*

What the observations of Van Horstok were does not appear. They seem to have been such as to convince Schlegel that his skeleton belonged to Lesson and Garnot's *D. superciliosus*.

The following is a description of this skeleton: No. 40; Voy. Horstok; Cape of Good Hope. Vertebræ: C. 7; D. 13; L. and Ca., 53; total, 73. Lumbars twenty. Chevrons twenty. Only the atlas and axis united. Superior transverse process of the seventh cervical vertebra long; the others rudimentary. Inferior transverse process of the sixth cervical rather long; of the fifth shorter; of the other cervicals, rudimentary. Neural spines of the third to the seventh cervicals very short. Neural spine of the first dorsal pointed; the succeeding ones increase in breadth backward to the tenth or eleventh dorsal, then again decrease. Those of the lumbars subequal. Neural arch obsolete on the sixtieth vertebra. Transverse process obsolete on the fifty-fifth vertebra. First six ribs with heads; these ribs also join the sternum. Sternum of four segments; the first largest, the last rather rudimentary. Acromion long and broad, reaching to the anterior angle of the scapula; coracoid about one-half the length of the acromion, broadened at the extremity. Radius and ulna straight. Carpals five; three large ones in the distal row, two smaller ones in the proximal row. (Manus defective.)

Skull.—The skull resembles that of *P. obscurus*, but the intermaxillæ are more nearly flat. The prenarial triangle extends about an equal distance before and back of the maxillary notch, and is depressed, but flat and not rugose. The sides of the intermaxillæ bordering the nasal aperture are beveled as in *Cephalorhynchus*. The maxillæ are but little bent. A wide opening (1^{cm} at the widest point) intervenes between the premaxillæ and extends along the entire beak. Palate very flat. Pterygoids on a wide base (4.1^{cm}); they are broken, but were apparently in contact, except at the tip. The ramus of the mandible is slender toward the symphysis, which is not strongly keeled. Teeth, $\frac{30\text{-}30}{30\text{-}29}$.

Scapula, 15.5^{cm} long; 9.8^{cm} high. Highest neural arch, 8.4^{cm}. Total length of the skeleton as mounted, 153^{cm}.

The chief peculiarities of the skull of this species are the flatness of the premaxillæ and the beveling of their proximal extremities. In these respects it is very different from that of *P. obscurus*, with which it agrees well in proportions. On account of the flatness of the intermaxillæ and the crowding of the foramina at the symphysis of the mandible, I am inclined to place this species in the genus *Lagenorhynchus*. The small

* Schlegel, Abhandlungen, Heft 1, 1841, p. 22.

number of vertebræ, however, and the comparative shortness of the transverse processes, are more characteristic of *Prodelphinus*.

In addition to the type at Leyden, I observed at Louvain a skull and a beak which appeared to belong to this species. These I did not have an opportunity to examine closely. While resembling *P. obscurus*, however, in general appearance, they differ in having flat premaxillæ. In the complete skull the pterygoids appear to be separate, a character the importance of which is strongly insisted upon by Professor Flower. The beak was purchased from a dealer, and possibly came from Africa.

Table of measurements.

LAGENORHYNCHUS SUPERCILIOSUS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
							At base of maxillary notches.	At its middle.		
40	M. Pays-Bas *.	*L. superciliosus* Schlegel.	Cape of Good Hope.	....	*Cm.* 35.6	*Cm.* 19.4	*Cm.* 8.5	*Cm.* 5.4	*Cm.* 3.2	*Cm.* 6.9

atalogue number.	ength of tooth-line.	ast tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		ength of mandible.	ength of symphysis of mandible.	ength of tooth-row of mandible.	epth between angle and coronoid process.	iameter of largest tooth.	umber of teeth.
			nterior margin of superior nares.	nd of crest of pterygoid.	rbits.	inder margins of temporal fossæ.	ength.	epth.						

tinguished by its color-markings and their disposition, as well as by numerous skeletal characters.

Brightwell's specimen, the type of the species, is in the Norwich Museum, where I had the privilege of examining and measuring it. It is not an old individual.

Table of measurements.

LAGENORHYNCHUS ALBIROSTRIS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of maxillary notches.	Breadth of beak— At its middle.	Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
555c	Cambridge Mus	.....	.....	....	44.1	21.9	14.4	8.1	5.3	.....
555*f*	...do	.....	Ramsgate ..	....	42.2	20.2	14.0	7.4	.....	.....
3028	R. Coll. Surg	.....	.....	...	43.0	21.2	14.6	7.9	4.4	10.4
n. n.	Norwich Mus ..	*L. albirostris*..	Yarmouth ..	Ad.	45.7	21.6	*13.5	8.4	5.1	10.9
916c	Brit. Mus	.....	Cromer	....	44.5	21.9	14.6	8.4	2.0	10.7
916*b*	....do	.....	.....	...	43.9	20.3	14.0	8.0	5.5	10.9
n. n.	Mus. Sci. and Art, Edinburgh. †	.....	.....	...	46.0	22.9	15.2	8.7	5.1	10.8

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to— Anterior margin of superior nares.	Extremity of beak to— End of crest of pterygoid.	Breadth between— Orbits.	Breadth between— Hinder margins of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Number of teeth.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
555c	.....	.....	.....	.....	22.6	18.7	.....	.....	.....	.....	.....	.....	{ 26—26 { 26—27
555*f*	.....	.....	.....	.....	21.9	18.0	.....	.....	.....	.....	.....	.....	{ 26—24 { 27—28
3028	18.7	3.8	28.2	28.2	23.1	17.7	10.1	6.0	35.5	4.4	18.4	8.5	{ 24— { 23—
n. n.	.....	.....	.....	.....	23.4	.....	9.5	.....	36.9	5.1	.....	.....	{ 26— { 26—
916c	22.3	3.9	28.9	.....	23.1	18.9	8.3	4.8	.....	.....	.....	.....	{ 28—27 { ?—?
916*b*	18.2	4.1	27.0	28.7	23.1	19.3	9.2	6.4	35.6	4.6	18.0	8.1	{ 26—26 { 27—25 (+?)
n. n.	.....	.....	.....	.....	23.5	18.8	7.9	6.4	.....	.....	.....	.....	.....

* Least. † Collected by Traill.

LAGENORHYNCHUS OBLIQUIDENS Gill.

Lagenorhynchus obliquidens, Gill, Proc. Acad. Nat. Sci., Phila., 1865, p. 177.
? *Delphinus longidens*, Cope, Proc. Acad. Nat. Sci., Phila., 1866, p. 295.
? *Clymenia longidens*, Dall, Scammon's Marine Mammalia, 1874, p. 288.
? *Clymenia similis*, Gray, Proc. Zool. Soc. London, 1868, p. 147.

This species is unquestionably valid, although closely related to *L. acutus*, Gray, and to *L. cruciger*, d'Orbigny. It would appear to be absolutely larger than the latter, judged by the skull, and more robust though not longer than the former. The National Museum is at present in possession of four adult skulls of Dr. Gill's species, and two entire skeletons, representing, respectively, an adult and a rather young individual. On comparing one of the adult skulls with a similar one from the large series of *L. acutus* in the Museum numerous differences become apparent. The margins of the rostrum in *L. obliquidens* converge very gradually from a point about an inch anterior to the notch to a point about the same distance from the tip. The outline of the rostrum does not suggest a triangle, therefore, as in *L. acutus*, but rather a rectangle, of which the anterior corners are rounded off. The surface of the intermaxillæ is more convex in *L. obliquidens* than in *L. acutus*, and the prenarial triangle is more elevated and extends further upon the rostrum. The orbits are much further apart in *L. acutus*, owing to the great expansion of the proximal half of the maxillæ. Viewed from the side, the skulls of the two species are strikingly different owing to the large size, quadrate form, and the posterior and superior extension of the temporal fossæ of *L. obliquidens*. The biting-power of this species must be much greater than that of *L. acutus*, not only on this account but because the teeth are larger and more deeply implanted in the alveoli. In both species the roots of the teeth are abruptly turned backward at their extremity, a character which is common in this genus.

The inferior surfaces of the skulls present many differences, but these are difficult to express on account of the complexity of the parts. The pterygoids are the least bell-shaped in *L. acutus* and extend much farther back than in *L. obliquidens*. The shape of their free margin and the extent of contact in the median line is widely different in these two skulls, but this is a character which is subject to much variation.

In proportions of parts the skulls of *acutus* and *obliquidens* show no consonance. The distance from the maxillary notch to the anterior end of the temporal fossa exceeds the width of the beak at the notch in *acutus*, but is less than the latter width in *obliquidens*. The breadth across the proximal end of the right maxilla from the lateral free margin to the superior nares equals the width of the beak at the notch in *acutus*, but the former only equals three-fourths the latter in *obliquidens*. The length of the free border of the malar only exceeds by a little more than one-half the length of the orbit in *obliquidens*, while in *acutus* the

two are very nearly equal in length. The premaxillæ scarcely form any part of the palate in *obliquidens*, but appear in nearly the whole of its distal half in *acutus*.

There are numerous other differences of proportions in the skulls which are equally striking. Taken together they form a sufficient basis for specific distinction.

The numerical relations of parts in the skeletons also offer characters for discrimination. The number of vertebræ in specimens of *L. obliquidens*, *L. acutus*, and *L. albirostris*, are as follows:

Collection.	Species.	C.	D.	L.	Ca.	Total.
U. S. N. M.	*L. obliquidens* (n. n. adult)	7	13	24	30	74
U. S. N. M.	*L. obliquidens* (14329, Juv.)	7	13	23 (or 24)	32 (or 31)	75
	L. acutus (Poelman)	7	15	19	39	80
R. C. S. E.	*L albirostris* (3028)	7	14	67		88

The last-named species clearly has many more vertebræ than *L. acutus*, while *L. obliquidens* has fewer. A critical examination of the immature skeleton of *L. obliquidens*, however, makes it necessary to allow for one or possibly two more caudal vertebræ, so that the total number in the latter species is brought nearer that in *L. acutus*, which sometimes has but seventy-nine vertebræ. The transverse processes of the twenty-first vertebra in the immature skeleton of *L. obliquidens* are long and truly lumbar in character and do not appear to have given attachment to a fourteenth pair of ribs, but such a pair would doubtless be found in some specimens of a series, and as *L. acutus* sometimes has but fourteen pairs the character will probably prove of no value in distinguishing the species. The difference in the relative number of lumbar and caudal vertebræ can not be in like manner disposed of, and would appear to constitute a real distinction between the two species.

The number of phalanges in the left manus of our skeleton of *L. obliquidens* is as follows: I, 2; II, 7; III, 5; IV, 1; V, 0. One phalange should probably be added in the case of figures III, IV, and V, as the specimen appears to be defective at these points. The numbers would then agree with those given by Gervais for *L. acutus*, viz. I, 2; II, 7; III, 6; IV, 2; V, 1.* Malm, it should be observed, gives quite a different formula, for *L. acutus*, namely, I, 2; II, 10; III, 6 (+1); IV, 3 (+ ?); V, 2.†

In *obliquidens* the transverse processes of the posterior lumbar vertebræ point forward, but in *acutus* backward.

There are two other species (known only from the skulls) with which *L. obliquidens* must be compared. These are *L. thicolea* and *L. clanculus*. The measurements given on p. 100 sufficiently indicate the differences existing between the skulls of *L. thicolea* and *L. obliquidens*. The rostrum

*Van Beneden and Gervais. Osteographie des Cetacées, pl. XXXV, fig. 33.

†Malm, Hvaldjur i Sveriges Museer, år 1869, p. 70.

in the former is relatively longer and narrower; the intermaxillaries are much narrower; the brain-case is narrower at the orbits; and the temporal fossæ are smaller. The teeth are more numerous and the skull is much lighter in all its parts. The skulls of *L. clanculus*, as already stated, appear to belong to a smaller species than *L. obliquidens*, and are much lighter. The rostrum is relatively broader than in *L. obliquidens* as is also the brain-case at the orbits, and at the posterior margin of the temporal fossæ. These fossæ, although of about the same length as those of *L. obliquidens*, are more depressed.

In the younger specimen of the species under consideration the teeth have been reset, and the number can not therefore be relied upon. In the adult skull, No. 1962, the teeth in the superior maxillary number 32 on each side; in the mandible, 29 on each side. They are conical and acute and lean strongly outward.

The color of *L. obliquidens* has been recorded both by Captain Scammon and Mr. Dall. The former describes it as follows:

> In point of color it is greenish-black on the upper surface, lightened on the sides with broad longitudinal stripes of white, gray, and dull black, which in most examples run into each other, but below it is of a pearly or snowy white. The posterior edge of the dorsal fin is tipped with dull white or gray, and sometimes the flukes are marked in the same manner.*

In another part of the same work Mr. Dall describes the color as follows:

> The animal is rather thick in proportion to its length; black above, with a strongly falcate dorsal. Below, white, to the edge of the patch passing from the lower lip below the pectorals and terminating a short distance behind the vent. A broad gray smouch on each side above the line of the black color, and interrupted about the middle of the animal on each side; the edges of the gray are ill-defined. The posterior edges of the pectorals and dorsal are also grayish.†

From these descriptions and the figures given by Scammon it would appear that the coloration of *L. obliquidens* differs somewhat from both of the well-known species *L. acutus* and *L. albirostris*, for in the last-named the white of the belly extends upon the upper lip, and in *L. acutus* the light color of sides occupies only an area rather high up and back of the dorsal fin.

Captain Scammon gives to this species a very wide range, but does not state localities. Mr. Dall, however, states that the specimens described by him were taken at Monterey, November 20, 1872. Dr. Gill's types (Nos. 1961–63) were obtained on the coast of California by Lieut. W. P. Trowbridge. The skeleton described above (No. 14329) was also obtained on the coast of California, but no particular localities are given in either instance. A defective cranium (No. 3123) is from Puget Sound.

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* Scammon, Marine Mammalia, 1874, 98.

† Dall in Scammon's Marine Mammalia, 1874, 293.

Lagenorhynchus Longidens Cope.

This species is known only from the single skull (No. 3886) briefly but accurately described by Professor Cope in 1866, under the name of *Delphinus longidens*. There is but one point in this description which I would criticise. Professor Cope writes as follows:

Delphinus longidens. Of the type of *D. (Tursio) obscurus* Gray, but with a considerably longer muzzle and much longer prenareal triangle, etc.

Measurements of the two type-skulls, according to the system which I have adopted, show that the total length and length of rostrum are absolutely the same in each, viz, total length 14.5 inches; length of rostrum, 7.9 inches.

In commenting upon his description Professor Cope justly remarks:

From the above [measurement] it will be seen that the nearest ally of this species is the *Delphinus (Lagenorhynchus) clanculus* Gray, in which the muzzle is considerably shorter and the cranium relatively longer and wider—that is, length of cranium proper equal in the latter to the length of the muzzle, and breadth at orbit a little greater than either. Its form renders a distinction between *Lagenorhynchus* and *Delphinus** improbable on present bases.†

Mr. Dall regards this latter view untenable in the light of Dr. Gray's revision of 1871, and places the species in the genus *Clymenia* (=*Prodelphinus* Gervais).

The skull upon which this species is based was received with the spoils of the United States Exploring Expedition, but the locality was unfortunately not given. The records show nothing except that the skull was packed with other objects in a box marked "B. 26—Z. (L.)" There is a second mandible in the collection (No. 4117), which bears the same marks, and undoubtedly belongs to the same species, but of this also the locality is unrecorded. After following out all the clews suggested by the original records, and the statements in both editions of the Mammalogy of the United States Exploring Expedition, I am forced to believe that it will never be possible to ascertain the history of these specimens, or to make sure that they did not form the basis of some of the species erected by Peale.

The type-skull is considerably broken, the pterygoid, malar, and tympanic bones being absent. Professor Cope states that the pterygoid bones were not in contact. After repeatedly examining this skull, I have become convinced that it is simply a small and youngish example of *L. obliquidens*. It presents no characters which can not be found in skulls of the latter species.

Clymenia Similis Gray.

The skull on which this species is founded can not be distinguished from skulls of *L. obliquidens*. It is nearly of the same size as the largest of our skulls of the latter species. The pterygoid bones are divergent posteriorly and the palatine table is constricted.

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* *Prodelphinus*, as now understood.—F. W. T.

† Cope, l. c., p. 296.

The skull also agrees in many points with *L. obscurus*, as Professor Flower has stated, and it is not at all impossible that the skulls now distributed among the three species, *obscurus*, *obliquidens*, and *similis*, represent only the individual variations of a single species.

Table of measurements

LAGENORHYNCHUS OBLIQUIDENS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of maxillary notches.	Breadth of beak— At its middle.	Breadth of intermaxillary at middle of beak.	Greatest breadth between outer margins of intermaxillary proximally.
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
14329	U.S. Nat. Mus.	.....	.....	Jr	39.4	19.7	10.2	7.1	4.6	8.4
1962	....do	.....	.....	...	41.9	20.7	11.2	7.9	4.6	9.4
3886	...do	*D. longidens*	.....	..	36.8	20.1	9.1	5.8	3.4	7.9
15096	Brit. Mus	*C. similis*	.....	....	38.1	20.8	*10.3	6.1	3.4	7.6

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to— Anterior margin of superior nare.	Extremity of beak to— End of crest of pterygoid.	Breadth between— Orbits.	Breadth between— Hinder margins of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Transverse diameter of teeth.	Number of teeth.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm*	
14329	16.5	3.5	24.7	26.2	17.8?	15.3?	8.9	7.1	31.3	.....	.....	6.9	....	{—27
1962	18.4	3.3	25.7	27.5	18.6	17.4	8.3	6.5	.....	.....	.....	.....	.5	{28—28 {32—32 {29—29
3886	17.5	3.6	24.5	.....	16.9	13.2	6.8	5.9	31.2	3.8	17.2	6.3	....	{31—31

[redacted]

In the European collections which I examined I found seven skulls which, in my estimation, should be accredited to this species. These are as follows:

British Museum:
No. 358*a*. Type of the species.
No. 358*a*. Type of *L. asia* Gray.
No. 1475*a*. Type of *L. fusiformis* Owen.
Paris Museum:
No. *a*3044. Labeled *L. asia*.
No. *a*3082. Labeled *L. asia*.
Cambridge University Museum:
No. 555*a*. Labeled *L. electra*.
Royal College of Surgeons of England:
New No. 3024. Labeled *L. electra*.

To these should be added a mandible in the—

U. S. National Museum:
No. 4108. Type of *Phocæna pectoralis* Peale.

The differences between the types of *L. electra* and *L. asia* are very slight, and are only such as might result from a difference in age. Even Dr. Gray, who was notoriously prone to exaggerate the importance of slight differences, regarded the latter species as possibly a variety of the former.* He pointed out clearly the differences of the two skulls in the following words:

> The skull, which is without teeth, very much resembles, in the depressed and expanded form of the brain-cavity and shape of the beak, the skull of *L. electra*, but it differs from that in the beak being rather more acute in front and more contracted in the middle of the sides, and in being rather smaller in size.†

So far as the width of the beak at the middle is concerned, it will be seen from the measurements that the type of *L. asia* is intermediate between the type of *L. electra* and the skull in the Royal College of Surgeons, which is also identified with the latter species.

Furthermore, laying aside the identifications with which the different specimens are ticketed, they can not be divided into two groups according to the width or the narrowness of the rostrum, but form a continuous series, the specimen in the College of Surgeons having the narrowest rostrum and that at Cambridge the widest. The single distinction given by Gray can not, therefore, have any value, and I was unable to discover any other valid characters.

The principal difference between the skulls of *L. fusiformis* and *L. electra* noted by Professor Owen in his original description of the former species is in the width of the rostrum at the maxillary notch. This character, as I have already stated above, I do not regard as sufficiently pronounced to have any weight.

The description, and especially the figure of *L. fusiformis*, becomes interesting, however, in connection with my discovery of the real affinity of Peale's *Phocæna pectoralis*. This species, which has been bandied

* Gray, Catalogue, 1866, p. 269. † Gray, l. c.

about for some time between the genera *Phocæna* and *Delphinus*, must, if my determination is correct, be placed in the genus *Lagenorhynchus*. The type-mandible from Hawaii agrees perfectly with that of the specimen of *L. electra* in the Paris Museum, which is, fortunately, from the same locality. It agrees also with the type (Brit. Mus., No. 358*a*) of that species. It may seem unwise to attempt to determine a species of *Lagenorhynchus* from the jaw alone, and in most cases I believe that it would be so. But the mandible of *L. electra* is so peculiar in its stout form and rounded coronoid region that it is at once distinguishable.

A difficulty now arises, however, because there is a decided lack of agreement between Peale's figures of *P. pectoralis* and Owen's figures of *L. fusiformis*, which, if my conclusions are correct, represent the same species. It should be remembered, however, that Owen described the external appearance of his species from drawings of an Indian artist,* while Peale had the specimen which he figured before him in the flesh. The animal figured by Professor Owen is represented as having a distinct, elongated beak, a character which arouses my suspicion of the accuracy of the drawing, for the reason that it is at variance with the shape of the head of all other species of *Lagenorhynchus* of which the external appearance is known.

The external measurements agree fairly together, but count for little, since those of *L. fusiformis* were apparently taken from the drawing.†

The descriptions of color agree but little, though the discrepancy may perhaps be due to the fact that the Indian specimen may not have been entirely fresh. The descriptions are as follows:

Phocæna pectoralis.

Color, blue-black; a white spot on each side of the breast in front of the pectoral fins; a frontal band of light slate-color extends a short distance behind the eyes; vent and abdomen light reddish-white; lips margined with reddish white. (Peale, U. S. Explor. Exped. Mamm. & Ornith., 1848, p. 32.)

Lagenorhynchus fusiformis.

The color of the spindle-shaped Dolphin is less darkly plumbeous than in the Gadamu, and becomes more gradually lighter towards the belly; the dorsal fin, the fore part of the pectoral and caudal fins, and the snout have the darkest pigment; the light ashy-gray belly shows no spots. (Owen, T. Z. S. VI, p. 23.)

We have, therefore, two specimens whose bones (so far as we know them) are alike, but whose external appearance is represented as widely different. As there are, so far as I am aware, no casts or mounted skins of *L. electra* in any museum we must pend judgment until more material has been collected. I believe, however, that the figure of *P. pectoralis* will be found to be essentially correct.

The reference to *L. electra* in the "Ostéographie des Cétacés" (p. 597) is very much confused. Three distinct specimens are referred to as figured in pl. XXXVI (fig. 6). The figure seems to be taken from No.

* Trans. Zool. Soc., London, VI, 1869, p. 17, pl. V, fig. 1.

† In the legend accompanying the plates of Professor Owen's Memoir (l. c., p. 46), the figure of *L. fusiformis* is said to be "diminished to scale." This scale is *not* that given on pl. V, but is apparently 7½ in. = 6 feet.

a3044, obtained by M. Ballieu in Hawaii. "Notre second exemplaire" is probably No. a3082, but the label does not state from whence it was derived. Is it the specimen "dont la présence a été constatée aux îles Bissagos, situées dans le golfe de Guinée?" This is a matter of some importance since all other specimens, of which the record is known, are from the Indian and tropical Pacific Oceans.

Table of measurements.

LAGENORHYNCHUS ELECTRA.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of maxillary notches.	Breadth of beak— At its middle.	Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
					Cm.	Cm.	Cm.	Cm.	Cm.	Cm.
358a	Brit. Mus.....	*L. asia*, Gray.....	.....	....	42.5	23.0	12.6	8.0	5.35	9.1
359a	....do	*L. electra*, Gray	.....	...	45.7	24.35	13.95	9.2	6.1	9.7
1475a	...do	*D. fusiformis* Owen	India ..	♀	44.5	24.4	13.7	9.1	5.5	9.2
a3044	Mus. d'Hist. nat..	.....	Hawaii.	....	45.8	24.9	*13.2	8.7	5.6	8.2
a3082	....do	.....	.....	....	45.8	24.9	*13.5	9.4	6.1	10.4
555a	Cambridge Mus..	.....	.....	....	44.8	24.0	15.6	10.3	5.8	10.2
3024	R. Col. Surg... ...	.....	.....	....	47.2	25.7	13.0	8.2	5.7	9.6
4108	U. S. Nat. Mus ...	*D. pectoralis* Peale.	Hawaii.	...	.....	.....	.....	.....	.....	.....

Catalogue number	Length of tooth-line.	Last tooth to base of maxillary notches.	Extremity of beak to— Anterior margin of superior nares.	Extremity of beak to— End of crest of pterygoid.	Breadth between— Orbits.	Breadth between— Hinder margins of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.		
358a	17.0	6.9	28.65	29.2	22.6	15.75	7.5	6.35	34.65	3.8	16.4	8.15	0.46	$\frac{23(+3)-23(+3)}{23-23}$
359a	18.1	7.9	31.3	.....	25.2	16.3	9.4	5.5	37.1	4.3	16.8	6.1	0.41	$\frac{25-25}{23-24}$
1475a	16.6	9.2	30.7	31.5	24.2	15.8	8.5	5.6	36.2	3.6	.....	8.5	0.41	$\frac{22-22}{(23)-(-23)}$
a3044	17.6	8.2	30.5	31.9	23.6	17.5	8.1	5.6	37.4	4.1	.....	.....	....	$\frac{22-22}{24-22}$
a3082	18.0	7.9	30.5+	32.5	24.9	18.0	9.9	6.6	.....	.....	.....	.....	....	$\frac{.....}{.....}$
555a	17.5	.....	29.6	30.1	26.0	18.4	9.6	5.8	.....	3.2	.....	.....	....	$\frac{21-22}{19-19}$
3024	17.7	9.5	.....	31.7	24.4	17.1	9.2	5.4	38.4	3.6	17.0	9.2	....	$\frac{23-22}{23-24}$
4108	.....	.....	.....	.....	.....	.....	.....	.....	35.6	3.8	16.3	9.1	...	$\frac{23\,?\,23\,?}{23-23}$

* Least. † From Peale.

LAGENORHYNCHUS OBSCURUS (Gray).

Delphinus obscurus, Gray, Spic. Zool., 1828, p. 2; Zool. Ere. & Terr., 1846, p. 37, pl. 16; Catalogue of Cetacea, 1st ed., 1850, p. 107.

Tursio obscurus, Gray, Catalogue, 2d ed., 1866, pp. 264 and 400.

Clymenia obscura, Gray, Proc. Zool. Soc., London, 1866, p. 215; ditto, 1868, p. 147, fig. 1 (pterygoid bones); synopsis, 1868, p. 6, pl. 16; supplement, 1871, p. 71, fig. 3 (pterygoid bones); Flower, Proc. Zool. Soc., London, 1883, p. 512.

? *Phocæna australis*, Peale, U. S. Explor. Exped., 1st ed., 1848, p. 33, pl. 6, fig. 2.

This species was originally described by Gray from a stuffed skin, but he afterwards included in the species a number of skulls in the British Museum. That the latter were properly referred to the species appears to have been confirmed by Professor Flower upon removing the skull from the type-skin in 1884. (See his *List*, p. 28.)

It has been customary among authors since 1868 to refer this species to *Clymenia* (=*Prodelphinus*). In the *Catalogue*, however, Gray, although referring the species to *Tursio*, makes the remark that "the skull of this species is intermediate between the *Lagenorhynchus* and *Delphinus*" (Catalogue Seals and Whales, p. 265). After going over the data many times it seems to me that it should properly be referred to the former genus. There is nothing in the characters of the skull that would militate against this view, and certain considerations regarding the exterior seem to confirm it.

First, the form of the head in the type specimen is unlike that of any species of *Prodelphinus* of which the exterior is known. There is no real beak, but on the contrary the head slopes gradually from the blowhole to the extremity, as in *Lagenorhynchus acutus*.

Again, the color seems rather that of a *Lagenorhynchus* than of a *Prodelphinus*. Gray's original description contains the following data regarding the color of the body:

> Collo ventreque albidis, fascea nigra ab angulo oris usque ad primas pectorales; striga obliqua laterali, alba postica; cæterum totus niger.
>
> In a young specimen in the same collection the colors are more defined; but even in the older specimens the lateral streaks are to be seen in certain positions—a fact which is not shown in the drawing. (Spic. Zool., p. 2.)

The figure of the young individual is not unlike Waterhouse's figure of *L. Fitzroyi* (Zool. Beagle, pl. 10), which species, indeed, Gray made synonymous with *obscura*. Though somewhat generalized, the figure in question, as also that of the older individual on the same plate of the *Spicilegia* (Pl. II, fig. 3), is certainly unlike any *Prodelphinus* we know.

The dimensions of the adult type-skin are as follows (measured in straight lines): Total length, 65 inches; tip of snout to corner of mouth, 8.7 inches; to eye, 10 inches; to blowhole, 9.5 inches; to anterior base of pectoral fin, 16.5 inches; to anterior base of dorsal fin (following the curves), 31.75 inches; length of the dorsal fin, 9 inches; vertical height of dorsal fin, 7.5 inches; length of pectoral fin, 11 inches; greatest breadth of pectoral fin, 3.5 inches; breadth of caudal fins, 15.75 inches.

Table of measurements.

LAGENORHYNCHUS OBSCURUS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of maxillary notches.	Breadth of beak— At its middle.	Breadth of internaxille at middle of beak.	Greatest breadth between outer margins of internaxille proximally.
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
354*a*	Brit. Mus.	.....	.....	...	36.8	20.1	9.3	6.1	3.3	7.8
4117	U. S. Nat. Mus.	.....	.....	...	.....	.....	.....	.....	.....	.....
354*d*	Brit. Mus.	.....	.....	...	35.5	19.3	8.7	5.5	3.0	7.1
81.10.28.1	.. do	.....	Coquimbo, Chili	..	40.6	32.9	10.1	6.5	3.7	8.0
576*m*	Cambridge Mus.	.....	.....	...	38.2	21.4	9.0	6.0	.....	.....
3030	R. Coll. Surg.	.....	.....	...	36.1	20.3	*8.9	5.7	3.2	7.6
3031	....do	.....	.....	....	36.1	19.7	*8.4	5.8	2.8	7.6

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notches.	Extremity of beak to— Anterior margin of superior nares.	Extremity of beak to— End of crest of pterygoid.	Breadth between— Orbits.	Breadth between— Hinder margins of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*		
354*a*	17.3	3.8	24.1	25.3	15.5	14.2	6.7	4.8	29.9	3.7	16.7	6.2	0.25	32–34 / 30–30
4117	.....	.....	.....	.....	.....	.....	.....	.....	29.9	3.6	16.9	5.8	....	——— / 30–30
354*d*	16.3	3.4	22.6	.....	14.1	13.5	5.9	3.8	29.4	2.8	16.2	6.2	0.32	32–31 / 30–29
81.10.28.1	18.8	3.8	27.6	.....	16.7	14.1	7.6	5.1	33.0	.....	17.3	.....	0.30	31–32 / 1–26
576*m*	.....	.....	.....	.....	15.8	.....	.....	.....	.....	.....	.....	.....	....	32 / 33
3030	17.1	3.2	24.0	24.1	15.2	13.6	6.3	4.4	29.8	3.8	17.4	5.7	....	32–33 / 32–31
3031	16.5	3.8	24.7	23.8	15.5	13.3	7.3	4.7	29.2	3.2	16.3	6.3	....	33–32 / 30–28

*Least.

8. SAGMATIAS.

Sagmatias, Cope, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 294.

This genus must be considered valid unless the characters given by Professor Cope can be proven to be the result of age or individual variation. These characters are the elevation of the premaxillæ immediately in front of the superior nares and the thinning out of the lateral free margin of the expanded portion of the maxillæ. Except in these two characters the genus shows a close approximation to *Lagenorhynchus*, with which I was at first inclined to unite it.

The genus is based upon the single skull described by Professor Cope under the name of *S. amblodon*. It belonged to an aged individual, as appears from the coalescence of the cranial elements and the bluntness of the teeth. Nothing is known of its history, except that it was captured at sea by the ship *Vincennes*, of the United States Exploring Expedition.

In size and proportion the skull resembles that of *Lagenorhynchus superciliosus*. The beak is more sharply pointed than is usual in that genus.

SAGMATIAS AMBLODON Cope.

Sagmatias amblodon, Cope, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 294.

Table of measurements.

SAGMATIAS AMBLODON.

...logue number.	Collection.	Type of—	Locality.	...and age.	...al length.	...gth of beak.	Breadth of beak—		...dth of intermaxilla at middle of beak.	...atest breadth between ...ter margins of inter-maxillæ proximally.
							...base of maxillary notches.	...ts middle.		
[redacted]										

9. FERESA Gray.

Feresa, Gray, Suppl. Cat. Seals and Whales, 1871, p. 78.
Feresia, Flower, Proc. Zool. Soc. London, 1883, p. 510.

The future development of our knowledge of this genus will be watched with much interest by cetologists. At present there is nothing to add to Gray's original description, and no additional specimens have been discovered.

I concur in Gray's opinion that the two typical skulls are clearly allied to *Lagenorhynchus electra*, and it may be found necessary eventually to include *Feresa* in that genus.

FERESA INTERMEDIA Gray.

Delphinus intermedius, Gray, Ann. Phil., 1827, p. 396.
Grampus intermedius, Gray, List of Mammalia, 1843, p. 106.
Orca intermedia, Gray, Zool. Ere. & Terr., 1846, p. 34, pl. 8; Catalogue of Cetacea, 1st ed., 1850, p. 96; 2d ed., 1866, p. 283.
Feresa intermedia, Gray, Suppl. Cat. Seals and Whales, 1871, p. 78.
Feresia attenuata, Gray, Journal du Muséum Godeffroy, Heft VIII, 1875.

I append measurements of the two typical skulls described by Gray, and which Professor Flower very properly brings together under the same specific name.

Table of measurements.

FERESA INTERMEDIA.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of maxillary notches.	Breadth of beak— At its middle.	Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
362*a*	Brit. Mus	*Orca intermedia*	.....	....	36.2	17.3	12.0	8.9	6.1	9.1
1672*a*	....do	*F. attenuata*	South seas....	....	35.0	16.8	10.7	7.5	5.2	9.1

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to— Anterior margin of superior nares.	Extremity of beak to— End of crest of pterygoid.	Breadth between— Orbits.	Breadth between— Hinder margins of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*		
362*a*	12.9	5.1	22.6	.....	21.1	15.3	9.2	7.3	28.9	3.0	13.5	7.9	.....	$\frac{11-11}{10-11}$
1672*a*	12.7	5.5	22.1	22.9	20.1	17.3	8.4	7.4	28.0	3.4	13.6	7.3	0.56	$\frac{12-11}{13-12}$

10. CEPHALORHYNCHUS Gray.

Cephalorhynchus, Gray, Cat. Cetacea, Brit. Mus., 1850, p. 106.
? Cephalorhynques, F. Cuvier, Hist. Nat. des Cetacées, 1836, p. 156.
Eutropia, Gray, P. Z. S., London, 1862, p. 145.
Eutropia, Gray, Synopsis of Whales and Dolphins, 1868, p. 7.

Although Gray credits the name *Cephalorhynchus* to F. Cuvier, it was the former naturalist who first made a formal separation of the species. Cuvier states, at the place cited:

Nous les *aurions* séparées des dauphins proprement dits sous le nom de céphalorhynques, *si* ces différences extérieures [previously pointed out] *eussent* entraîné des différences intérieures plus marquées. Un examen de ces espèces plus approfondi que celui que nous en avons pu faire déterminera peut-être plus tard cette séparation.*

This aoristical genus includes representatives of four genera, the first mentioned being *D. rostratus*, a species now referred to the genus *Steno* If *Cephalorhynchus* were to be accepted upon the authority of Cuvier, it would have to be applied, under the rules, to the species included in *Steno*.

Gray's distinctions are quite vague, and he has included *D. obscurus* in his subgenus, which is now referred to *Lagenorhynchus*. His first-mentioned species, however, is *D. Heavisidei*. Furthermore, his definition of *Cephalorhynchus* is, as already stated, a formal one, and the name itself is Latinized.

Professor Flower has left but little to be said regarding this genus and the species included under it. More facts must be forthcoming before the species can be placed upon a satisfactory basis.

The principal cranial characters of the genus seem to me to lie in (1) the separation of the pterygoids, (2) the great height of the nasal region, and (3) the expansion of the beak at the middle of its length. The expansion of the beak causes the rami of the mandible to bow out. As they are also bent downward toward the symplysis, the shape of the jaw is quite peculiar and characteristic.

of the skulls which I examined in the Oxford, Paris, and Leyden Museums, and also of the type skin of the species which is in the British Museum. The dimensions of this latter specimen are as follows:

Measurements of a mounted skin of Cephalorhynchus heavisidei (type), from the Cape of Good Hope.

	Meters.
Total length	1.092
Extremity of beak to corner of mouth	0.155
Extremity of beak to eye	0.157
Extremity of beak to blowhole	0.158
Extremity of beak to anterior base of pectoral	0.267
Extremity of beak to anterior base of dorsal	0.516
Length of base of dorsal	0.178
Vertical height of dorsal	0.082
Length of pectoral from the anterior base	0.145
Breadth of flukes	0.247
Greatest width of pectoral	0.056

The beak is not sharply defined. The teeth are small and round. At 5.1^{cm} from the extremity of the mandible the distance between the teeth of opposite sides is 4.6^{cm}.

A cast of the head of this specimen was recently received by the National Museum through the liberality of Professor Flower.

Another stuffed skin is in the museum of Leyden. The form is very similar to that of *Phocæna*. The dorsal, however, is more sharply triangular. The forehead is somewhat concave (this may be due to drying). The color is black throughout, except a rather broad band of white, which starts about 8^{cm} posterior to the dorsal fin and somewhat below the middle of the side and runs obliquely downward, becoming merged in a second white area which occupies the center of the belly. Another similar but smaller band appears below and behind the first and is also confluent with the white of the belly. This specimen is presumably one of the "mehrere vollständige Häute" mentioned by Schlegel in the *Abhandlungen* (p. 31) as received from the Cape of Good Hope.

In one of the young skeletons at Leyden I find the vertebræ two more than the number given by Professor Flower. The formula, according to my notes, is as follows: C. 7, D. 13, L. and Ca. 47 = 67. This skeleton, as mounted, is 125^{cm} in length. The atlas and axis only are united. The seventh cervical vertebra has a superior transverse process like the transverse process of a dorsal. A superior transverse process is present also in the sixth cervical, but it is not so large. The transverse processes become obsolete at the forty-seventh vertebra, the neural arches at the fiftieth vertebra. The lumbar neural spines are sickle-shaped. The scapula is high, with a short, broad, and incurved acromion; the coracoid about equals the acromion in length and is broadened distally. The scapula is 8.9^{cm} high, 11.2^{cm} long. The first six

pairs of ribs possess heads. The skull of this specimen shows that the animal was quite young; the boundaries of the occipital elements are plainly discernible.

The skull "*b*" is also young and shows the outlines of the occipital element. The intermaxillæ are very thick and high proximally and remind me of those of *Sagmatias amblodon*. The hinder margins of the temporal fossæ are but faintly marked out in this and the preceding skull.

The skeleton No. 1670*a*, at Oxford, is also young. The palate is very flat, the rami of the mandible are strongly bent outward, and the symphysis is very short. I counted the following vertebræ: C. 7, D. 13, L. and Ca. 45 = 65. The first six pairs of ribs are furnished with heads and five pairs join the sternum. The scapula is 9^{cm} high, 11.9^{cm} long. The humerus and radius together measures 9.7^{cm}. The sternum is 11.7^{cm} long and 6.3^{cm} wide in front. The atlas 11.9^{cm} wide, 7.6^{cm} deep. The carpels are five. The neural spines are narrow antero-posteriorly and bend slightly forward in the lumbar region, in this respect somewhat resembling those of *Lagenorhynchus*. Only the atlas and axis are united.

Table of measurements.

CEPHALORHYNCHUS HEAVISIDEI.

Catalogue number.	Collection.	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
						At base of maxillary notches.	At its middle.		
				Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*

Table of measurements—Continued.

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.		Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*		
X.	12.1!	2.6	17.1	18.5	13.1	14.6	6.7	4.6	.....	.....	.....	.....	....	.....
B.	12.2	2.8	16.8	.....	12.8	14.6	7.0	5.0	.....	2.2	.....	.....	....	24–26 27—26
1670*a*	12.7	2.4	17.0	.....	12.6	13.9	6.3	4.8	23.4	2.3	.....	5.3	....	26—26 26—26
3062*a*	13.0	2.5	17.3	18.6	13.0	13.7	6.3	5.3	23.1	2.5	.....	5.1	....	29—28 29—29
3063*a*	11.4	2.3	15.8	.....	12.2	13.7	6.1	4.3	22.9	2.5	.....	5.3	....	26–26 26—25
3061*a*	12.7	2.3	16.5	.....	13.0	12.7	6.6	4.8	22.1	1.8	.....	5.6	....	.....
3064*a*	11.9	2.0	16.0	17.3	12.2	12.7!	.....	.....	21.1	2.3	.....	4.8	....	28—28 —26

CEPHALORHYNCHUS ALBIFRONS True.

Electra clancula Hector, Trans., New Zealand Inst., v, 1873, p. 160–162, pls. 1 and 3 (skull and exterior); Hutton, Trans. New Zealand Inst., ix, 1877, p. 350.

It is evident from the figures given by Hector that this species is not allied to the section of the genus *Lagenorhynchus* which Gray called *Electra*, but rather to the genus *Cephalorhynchus*. It also appears to me equally plain that it is not identical with the preceding species, *C. heavisidei*. Hector's account is full and clear, and the essential statements in it are repeated by Hutton, who appears to have written from his own knowledge. The latter writer states that it is "abundant all around the coasts of New Zealand," while Hector affirms that the different individuals observed were very uniform in color.

The species differs from *C. heavisidei* chiefly in having the whole head white, and in having a dorsal fin ovate rather than triangular in outline. The cervical vertebræ are represented to be anchylosed together into a single mass, but this is probably an error.

The skull apparently very closely resembles that of *C. heavisidei*, but is larger, with wider nares. The pterygoids, according to Hector's figure, are large and constricted at the base somewhat as in *C. eutropia*.

The entire animal would appear to be larger than *C. heavisidei*. Hutton gives its length as from 4 to 5 feet. The latter dimensions are not reached by any of the specimens of *C. heavisidei* thus far acquired, so far as I am aware.

The skulls of *Cephalorhynchus* from New Zealand in the Paris Museum are larger than those from the Cape of Good Hope. The rostrum in the former occupies one-half the total length, but in the latter only about 46 per cent. It is possible that the New Zealand skulls belong to the species under discussion.

The relations of these two species to a third recently discovered will now be considered. This species is

CEPHALORHYNCHUS HECTORI (Van Beneden).

Electra hectori, Van Beneden, Bull. Acad. R. Belgique, 3d ser., I, 1881, pp. 877-887, Pl. II.

The specimen figured and described by Professor Van Beneden was captured in New Zealand waters. His admirable figures and description leave no room for doubt as to its generic position, but its specific relationships are not so readily made out.

Externally the specimen differs from the figures of *C. heavisidei* in having an ovate dorsal fin, and in that the throat and lower jaw are white rather than black. On the other hand, it lacks the white forehead of *C. albifrons*, but agrees with that species in the shape of the dorsal fin. The skull, according to Professor Van Beneden, agrees perfectly with that figured in the *Ostéographie*, Pl. XXXVI, fig. 1, which seems undoubtedly to belong to *C. heavisidei*. The vertebral formula, however, does not agree exactly with that of *C. heavisidei*. In the latter species the normal formula is probably as follows: C. 7, D 13, L. 15, Ca. 30=65. Van Beneden's specimen gives the following formula: C. 7, D. 14, L. 15, Ca. 27=63.

Regarding the differences, it may perhaps be said that the last-mentioned is due to individual variation. The color of the head and the shape of the dorsal fin on the contrary can scarcely be so regarded. But the color of the head is most like that of *C. heavisidei*, while the shape of the dorsal fin resembles that of *C. albifrons*. To put it in either of these species, therefore, we must disregard one or the other of the distinctions. For the present, it appears to me, it must stand as an independent species, and I have ranked it as such in the *Synopsis*, though with some misgivings, arising from geographical considerations.

CEPHALORHYNCHUS EUTROPIA (Gray).

Delphinus eutropia, Gray, Proc. Zool. Soc. London, 1849, p. 1.
Eutropia dickii, Gray, Proc. Zool. Soc. London, 1866, p. 215.
Tursio eutropia, Gray, Cat. Seals and Whales, 1866, p. 262.
Cephalorhynchus eutropia, Dall, in Scammon's Marine Mamm., 1874, p. 289.

The only specimens of this species hitherto recorded are the two skulls in the British Museum reported to have come from the coast of Chili. Of these the type (No. 936*a*) is somewhat the smaller, but

otherwise is practically identical with the second specimen (No. 936*b*). While in London I purchased of Mr. E. Gerrard another specimen of the species, also said to have been received from the coast of Chili. This skull (No. 21167) is intermediate in size between the two in the British Museum and resembles them very exactly, although the tooth-line is a trifle longer. The number of teeth is the same, viz, $\frac{31-32}{32-31}$. The type specimen (936*a*) appears to have somewhat smaller temporal fossæ than the other two; it may be a female.

In cranial characters this species appears to differ from *C. heavisidei* principally in having the pterygoids longer and more closely approximated at the base. The brain-case also appears to be considerably narrower and the teeth slightly more numerous. The skull is larger than that of *C. heavisidei*.

We know nothing of the skeleton or external form of this species.

Table of measurements.

CEPHALORHYNCHUS EUTROPIA.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak	Breadth of beak— At base of mandibular notches.	Breadth of beak— At its middle.	Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
936*a*	Brit. Mus	*D. eutropia*	Chili	.....	36.7	19.7	8.6	6.7	3.2	6.6
936*b*	...do	.....	... do	.....	32.8	17.3	7.2	5.3	2.3	5.3
21167	U. S. Nat. Mus.	.....	(?) Chili	.....	34.3	18.7	7.6	6.1	2.5	5.8

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notches.	Extremity of beak to— Anterior margin of superior nares.	Extremity of beak to— End of crest of pterygoid.	Breadth between— Orbits.	Breadth between— Hinder margins of temporal fossæ.	Temporal fossæ. Length.	Temporal fossæ. Depth.	Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*		
936*a*	16.9	3.8	22.6	.....	15.2	14.2	6.8	6.0	30.0	3.0	.....	6.6	0.25	$\frac{30-30}{30-31}$
936*b*	14.4	3.5	19.1	21.0	13.1	13.2	6.7	6.0	26.7	2.7	15.2	5.5	0.25	$\frac{31-30}{28-30}$
21167	16.2	2.5	21.1	23.4	13.9	13.7	6.7	5.6	27.7	.....	.....	5.6	.....	$\frac{31-32}{32-31}$

11. NEOMERIS Gray.

Neomeris, Gray, Zool. Erebus & Terror, 1846, p. 30.

This genus appears to have but one character to distinguish it from *Phocæna*, namely, the absence of a dorsal fin. I was unable to discover any peculiarities in the skull or the remainder of the skeleton which could be regarded as sufficient to warrant a separation from the latter genus. Is the absence of a dorsal fin a sufficient generic character? I believe that it is, or at least must be so regarded until we know more of the anatomy of *Neomeris*. The case is somewhat different from that of *Leucorhamphus*, because in that genus we find the absence of a dorsal fin correlated with certain characters in the skeleton. In *Neomeris* no similar correlation has been pointed out. On the other hand, the dorsal fins of the three species of *Phocæna* show no signs of degeneration and furnish us no steps by which to descend to *Neomeris*. It may be, however, that when the anatomy of *Neomeris* is known many new distinctions will be discovered. In the present state of knowledge I would adopt Professor Flower's conservative course, and leave the genus to be sustained or set aside by later investigations.

Only a single species is recognized in the following pages, viz, *N. phocænoides* (Cuvier).

NEOMERIS PHOCÆNOIDES (Cuvier).

Delphinus phocænoides, Cuvier, Règne Anim., 2d ed., I, 1829, p. 291.
Delphinus melas, Temminck, Fauna Japon., Mammif. marin., 1850, p. 14, pls. 25–26.
Delphinapterus molagan, Owen, Trans. Zool. Soc. London, VI, 1869, p. 24.
Neomeris phocænoides, Gray, Zool. Erebus & Terror, 1846, p. 30, Malm. Sven. Akad. Handl., n. f., IX, I, 1870, p. 77.
Neomeris kurrachiensis, Murray, Ann. & Mag. Nat. Hist., 5th series, XIII, 1884, p. 351.

The three specimens of this animal which fell under my notice are as follows:

MUSEUM D'HIST. NAT., PARIS.
No. A. 3087. Skull. Coast of Malabar. Dussumier. Type of *D. phocænoides* Cuvier.
No. A. 3086. Skull. Cape of Good Hope.
LEYDEN MUSEUM.
Skeleton. Japan. Brüger. Type of *D. melas* Temminck.

These three skulls agree well together, but in Temminck's specimen the beak is somewhat the longest, while the breadth of the brain-case is least. In this skull the thickened portion of the intermaxillæ in front of the nostrils rises very high. Distally the intermaxillæ are flat. The foramen magnum is large, lozenge-shaped, and a little higher than broad. The condyles are widely separated.

The total length of this skeleton is 128^{cm}. I counted the following vertebræ: C. 7, D. 13, L. & Ca., 43 = 63. The atlas and axis are united,

The transverse processes of the former are much less developed than in *Phocæna*. The inferior transverse processes of all the cervical vertebræ are rudimentary. In the seventh cervical the superior transverse process ends in a facet to which is attached a short rudimentary cervical rib. The superior transverse process of the sixth cervical is short and tubercular. The first seven ribs have heads which touch the centra of the vertebræ. The neural spines, which are broad and low in the dorsal region, are obsolete in the neck. The sternum is very short and broad, and has four pairs of ribs articulated with it. The transverse processes become obsolete at the forty-third vertebra and the neural at the forty-seventh vertebra. Seventeen chevron bones are present. The skeleton is described by Temminck at some length, and I am therefore spared the necessity of giving a complete account of it.

In 1884 Mr. F. A. Murray described an animal of this genus from the Sind coast, which he made the type of a new species, *N. kurrachicusis*. Such of his measurements of the skull as may be compared with those which I have recorded indicate a correspondence in proportions between his specimens and the type of *N. phocænoides*, and I find nothing in the description to show that his specimen was specifically distinct from the latter species. The small rudimentary teeth at the extremity of the alveolus are indicated in Temminck's figure. The dorsal area of spiny tubercles is also indicated in Temminck's figure of the exterior. The purplish-red patch on the throat is not mentioned by Temminck, but even if the two specimens differ in this respect, they could scarcely, on that account alone, be regarded as specifically distinct. I believe that we may regard Mr. Murray's description as applying to *N. phocænoides*.

Mr. Murray's measurements are as follows:

	Inches.
EXTERIOR:	
Length along curves from tip of snout to notch between caudal flukes	52
Length straight	45
Tip of snout to pectoral fin	1.0
Caudal flukes	9 × 3.
Distance of blowhole from tip of snout along curve	6.5
Distance from angle of mouth to eye	1.62
Vent from root of caudal fin	14.0
SKULL:	
Length of skull over curves to upper edge of foramen magnum	10.
Length straight from below	8.
Height of skull (vertex of superoccipital)	4.25
Tip of snout to blowhole	4.25
Tip of snout to interparietal	6.25
Interparietal to upper edge of foramen magnum	3.75
Across maxillaries	4.75
Across blowhole	1.5
Length of malar	2.0
Length of brain cavity	4.0
Across paroccipitals	3.37
Greatest space between occipital condyles (upper)	1.5

SKULL—Continued.	Inches.
Smallest space between occipital condyles at lower third	1.0
Vertical diameter of foramen magnum	1.75
Breadth across last teeth on each side of upper jaw	2.5
Breadth across last tooth on each side of lower jaw	2.5
Teeth line in upper and lower jaws	2.5
Length of lower jaw at coronoid process	5.62
Greatest vertical depth of ramus	2.62
Palate	4.0

Owen's *Delphinapterus molagan*, from the vicinity of the Cape of Good Hope, belongs apparently to this species.

N. phocænoides appears to have a wide range, extending at least from the Cape of Good Hope to Japan.

Table of measurements.

NEOMERIS PHOCÆNOIDES.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak— At base of maxillæ notches.	Breadth of beak— At its middle.	Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
n. n.	Mus. Pays-Bas.	*D. melas*	Japan	...	22.8	8.4	16.7	4.7	2.7	4.0
a3086	Mus. d'Hist. nat.	*N. phocænoides*	Cape G. Hope	....	18.8	6.2	6.6	4.3	2.5	3.4
a3087	....do		Malabar	....	18.8	6.3	6.3	4.4	2.5	3.0
(*)		*N. kurrachiensis.*	Sind coast	....	20.3	.....	...	.....	.....	.....

...ber.	...th-line.	...base of maxil... notch.	Extremity of beak to— ...gin of ...res.	Extremity of beak to— ...pterygoid.	Breadth between— ...ins of ...sse.	Temporal fossæ.		...dible.	...phyals man... le.	...n-row of man... le.	...n angle and ...process.	...erior nares.	...th.

12. PHOCÆNA Cuvier.

Phocæna, Cuvier, Règne Animal, I, 1817, p. 279.

The genus *Phocæna* is readily distinguishable from all the remaining genera of the family, except *Neomeris*, by the shape of the teeth. From the latter genus it differs in having a dorsal fin.

Professor Flower's admirable diagnosis holds good for all the species, except, as I have already pointed out elsewhere,* for one observed in the North Pacific by Mr. Dall, which I have named *P. Dallii*. In this species the number of vertebræ rises to ninety-seven or ninety-eight, and the dorsal fin is falcate. In these characters the species shows affinity to *Lagenorhynchus*, but, on the other hand, the skull (the only portion of the skeleton preserved) is that of a *Phocæna*.

Putting aside the number of vertebræ and the form of the dorsal fin, we still have in the form of the teeth, the shape and position of the pterygoids, the form of the premaxillæ, and the presence of a dorsal fin, sufficient characters for the differentiation of the genus.

I have elsewhere stated my opinion that the number of valid existing species of this genus is probably reducible to four, viz, *Phocæna communis* Lesson; *Phocæna lineata* Cope; *Phocæna spinipinnis* Burmeister; *Phocæna dallii* True. *P. pectoralis* Peale, I have shown in another part of this work to be probably identical with *Lagenorhynchus electra* Gray (p. 101). *P. tuberculifera*, Gray, was finally admitted by that author to be the same as *P. communis* Lesson. *P. brachycion*, Cope, and *P. vomerina*, Gill, have never been proven identical with *P. communis*, Lesson, but Professor Flower, in 1883, expressed the opinion that such was probably the truth, and I have myself reached that conclusion. As regards the identity of *P. lineata*, however, the material at command is scarcely sufficient to warrant any very positive assertions. The type-skeleton is missing and nothing but the painted cast remains, and it is evident that to base any conclusions upon the color of a painted cast alone is hazardous. Special difficulty attends the discrimination of species in this genus, because both the body as a whole and the skeleton are subject to great variations in proportions and details of form.

The characters drawn from the relation of the vomer to the palatines, which are employed by Professor Cope and Dr. Gill in the separation of the different nominal species, are valueless.† To find other characters is a task to which I have devoted my attention, but thus far without success. I am constrained for the present to look upon *P. communis*, *brachycion*, *lineata*, and *vomerina* as identical.

The species here recognized are, therefore, *Phocæna communis* Lesson, 1827; *Phocænas pinipinnis* Burmeister, 1865; *Phocæna dallii* True, 1885.

* Proc. U. S. Nat. Mus., VIII, 1885, pp. 95–98.

† Cope, Proc. Acad. Nat. Sci. Philadelphia, 1876, p. 134. Gill, l. c., 1865, p. 178. I should state, however, that Dr. Gill has informed me that he no longer places any confidence in these characters.

PHOCÆNA COMMUNIS Lesson.

Delphinus phocæna, Linné, Syst. Nat., 10th ed., 1758, p. 77.
Phocæna communis, Lesson, Man. de Mammalogie, 1827, p. 413. (*Fide* Flower.)
Phocæna brachycium, Cope, Proc. Acad. Nat. Sci. Phila., 1865, p. 279.
Phocæna vomerina, Gill, Proc. Acad. Nat. Sci. Phila., 1865, p. 178.
? *Phocæna lineata*, Cope, Proc. Acad. Nat. Sci. Phila., 1876, p. 135.

Of Phocænas from the east coast of America there are in the national collection three complete skeletons, two of young individuals and one of an adult; four additional skulls; and three casts from fresh specimens. Of *P. vomerina* there is one young skeleton and three skulls. There are also in this collection the type-cast of *P. lineata* and a skeleton and two skulls of *P. communis*.

All the specimens from the east coast, except No. 16610, Cape May, N. J., adult ♀, are from Eastport, Me., and are not adult. The number of vertebræ in the three skeletons is as follows:

(*a*) No. 13301, Eastport, Me., C. 7; D. 13; La. & Ca. 44=64.
(*b*) No. 13305, Eastport, Me., C. 7; D. 12; L. & Ca. 22 + *=?.
(*c*) Unnumbered, Eastport, Me., C. 7; D. 13; L. & Ca. 46=66.
(*d*) No. 16610, ♀, Cape May, N. J., C. 7; D. 13; L. & Ca. 47=67.

In the skeleton of *P. vomerina* the formula is as follows:

(*e*) No. 14331, California, C. 7; D. 12; L. & Ca. 45 (+1)†=65 (or 66).

Three skeletons from the European coast, mentioned by Fischer, have the vertebræ as follows:

(*f*) C. 7; D. 13–14; L. & Ca. 45–48=65–69.

It is evident that no character can be derived from differences in the number of vertebræ.

In all the American skeletons the caudal artery first perforates the thirty-ninth vertebra counting from the last vertebra. This is, however, a character of no value in differentiating *P. communis*, since in the skeleton figured by Van Beneden and Gervais (Ostéog., Pl. LV) the first perforation is in the thirty-eighth vertebra.

In his paper in the Proceedings of the Philadelphia Academy, 1876, Professor Cope brings forward the shape of the portion of the vomer visible behind the palatines as a specific character. In two of the four skulls from Eastport the vomer appears behind the posterior margin of the palatines, while in the remaining two it does not. The same is the case as regards the four skulls from the Pacific coast: in two it appears, in the others, not. In one of the skulls of *P. communis* figured by Van Beneden and Gervais, the vomer is visible, in another it is not. It is certain, therefore, that this character, as already stated, is valueless.

As regards the other characters given by Professor Cope for his *P. brachycium*,—the shape of the muzzle, the prenarial triangular area,

* Most of the caudal vertebræ are lacking.
† The last rudimentary vertebra is evidently lacking.

the proximal ends of the premaxillæ, the nasals, and the portion of the vomer visible on the palatine surface,—I find that no two of the Eastport skulls agree. They can therefore scarcely be regarded as of importance in distinguishing the species.

In the List of the Cetacea in the British Museum,* Professor Flower intimates that the skull of *P. vomerina* is larger than any other Phocæna skull in that collection. In looking over our own series, I was at first struck by the size of two of the skulls of *P. vomerina*, but on comparing M. Fischer's measurements I find that neither of these is as large as that of his specimen "*D. Femelle très adulte*,"† nor are they as large as Malm's specimen "t."‡ The largest skull of *P. vomerina*, No. 9078, from Puget Sound, is 29.3^{cm} long, but it does not show any considerable occipital crest nor other signs of age; while, on the other hand, No. 16610, an adult female of *P. brachycium* from Cape May, N. J., though only 26.6^{cm} long, has the crest strongly developed. That this fact is without significance, however, appears from the consideration of two other skulls, both of which are 26.6^{cm} long. One of them, No. 9164, is from Eastport, Me., and should represent *P. brachycium*; the other, No. 9077, is from Puget Sound, and represents *P. vomerina*. The latter has the sutures between the elements of the occipital closed, while in the former they are still open. The crest also is rather more pronounced in *P. vomerina*. We have here, therefore, a fact exactly opposed to that just presented, namely, in two skulls of equal size that of *P. vomerina* appears to be the older, and might be presumed, therefore, to be the smaller species. It appears, therefore, that the absolute size of the different skulls gives us no grounds for the distinction of species.

As regards proportions, there can be no question that the girth of the body of the specimen which Professor Cope called *P. lineata*, as compared with its length, is much less than in the specimen from Eastport, with which he compared. But it should be held in mind that the latter is only 43½ inches long, while the type of *P. lineata* is 70 inches long. The former is evidently very young, since a skeleton (No. 13301, from Eastport), which measures fully 46 inches, has the sutures defining the limits of the elements of the occipital still open.

The large size of the head and the thickness of the body I look upon as fœtal characteristics not yet outgrown.

It is manifestly unwise to compare the type of *P. lineata*, which shows evidence of being adult, with so young an individual as the Eastport specimen. Fortunately we have two other casts nearly equaling the type of *P. lineata* in length. Of the larger of these, No $\frac{13359}{16610}$, an adult female, we have the entire skeleton. In the following table are compared the

* List of the Cetacea in the Brit. Mus., 1885, p. 16.

† Fischer, Actes Linn. Soc. Bordeaux, XXXV, 1881, p. 165.

‡ K. Svenska Vetens. Akad. Handling., new ser., IX, i, 1871, p. 75.

proportions of this specimen and the type of *P. lineata*, the measurements in both cases being from the casts:

Measurements.	13339. Adult ♀. Cape May, N. J.	12181. ♀. New York Harbor. (Type of *P. lineata*.)
	Inches.	*Inches.*
Total length	68.0	70.0
Extremity of snout to eye	8.5	7.0
Extremity of snout to blowhole	7.0	7.0
Extremity of snout to corner of mouth	4.75	4.75
Extremity of snout to anterior base of pectoral	13.0	14.5
Extremity of snout to anterior base of dorsal	29.0	30.0
Vertical height of dorsal	4.0	3.75
Length of pectoral	7.0	7.25
Greatest width of pectoral	3.5	.....
Width between points of flukes	12.5	15.5

Considering the variation in proportions occurring in this genus, I think it will be admitted that the proportions in these two individuals are remarkably similar, and that No. 13339 must be identified as *P. lineata*, if such a species exists. But the skeleton of this individual (osteological No. 16610) is at command and it exhibits no characters by which it may be distinguished from a skeleton of *P. communis* from European waters. It is therefore strongly probable that the missing skeleton of the type of *P. lineata* was likewise identical with that of *P. communis*.

The measurements of *P. vomerina* given by Scammon are taken from two individuals, one 4 feet 8 inches long, the other but 4 feet.* In a skeleton from California, which is 4 feet long, the suture between the atlas and axis is plainly visible, the epiphyses of the centra are free, and the elements of the occipital are distinct. It is proper, therefore, to hold that Scammon's specimens were both young, and to compare them only with young specimens from the Atlantic. When we come to examine Scammon's measurements, however, we find the differences in the proportions of the two individuals so great that we can not hope for any satisfaction in comparing them with Atlantic specimens. It is true that Scammon's two specimens belonged to opposite sexes, but the differences are too great to be ascribed to difference of sex. For example, in the female, which was 48 inches long, the width of the pectoral fins was as great, the height of the dorsal greater, and its length along the back as great as in the male, which was 56 inches long. In the small female, also, the distance from the extremity of the snout to the eye was as great as, and to the blowhole greater than, in the larger male. In comparing these specimens with others from the Atlantic, therefore, we shall be at a loss to determine whether the differences observable are to be regarded as indicating specific distinctness or as being due to individual variation. As the Atlantic Phocænas

* Marine Mammalia, p. 96.

also vary greatly in proportions, we shall gain nothing by comparison. On this point we must await the result of future investigations

We turn finally to the question of color. The color of *P. lineata* is accurately described by Professor Cope (l. c.). The back upper half of the head, posterior part of the tail, flukes, and pectoral fins are black. The sides are pinkish and the belly is white. A black line passes from the base of the pectoral fin to the corner of the mouth. The edges of the lower lip are black. The Cape May female and another female specimen, 5 feet 1 inch long, have nearly the same coloration, except that the sides are yellowish instead of pink and the light color of the belly extends nearly to the flukes and leaves only a slight band of dark color around the lower lip. The Cape May specimen also has no dark band from the pectoral fin to the mouth, but it exists in the second female. Are these differences in color sufficient to warrant the separation of *P. lineata*?

M Fischer's figure of an old female (Pl. VII, fig. 1) agrees in coloration and form with the cast of *P. lineata*, except that the sides are gray instead of pink and that the band of color from the pectoral fin to the mouth is broad and gray instead of narrow and black.

In point of color, Scammon's description of *P. vomerina* is applicable to M. Fischer's specimens of *P. communis*. I subjoin Scammon's description of the female of *P. vomerina* and the description by Lafont of a female of *P. communis*:

P. vomerina (female).

The female is of the same color above (black); it is lighter on the sides, with a narrow black streak running from the corner of the mouth to the pectorals, and the lower portion of the animal is of a milky whiteness; yet the pectoral and caudal fins are black underneath or of a dark gray. [Scammon, Marine Mam., p. 95.]

P. communis (female).

Dos noir; flancs d'un gris de fer jaspé de blanc; abdomen d'un blanc un peu grisâtre; pectorals noires; une ligne noire, très étroite, part de leur attache et se dirige vers la commissure labiale; rostre noir. (Lafont.) [Fischer, l. c., p. 165.]

It will be observed that Lafont's specimen only differs in having the white of the belly "un peu grisâtre." In another specimen this region was white, as in Scammon's *P. vomerina*.

Summing up the available evidence I find no reason to regard *P. brachycion* or *P. vomerina* as distinct from *P. communis*. *P. lineata*, if distinct, differs only in color, a character which in this genus must be looked upon with distrust.

Table of measurements.

PHOCÆNA COMMUNIS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of internaxillæ at middle of beak.	Greatest breadth between outer margins of internaxillæ proximally.
							At base of maxillary notches.	At its middle.		
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
9164	U. S. Nat. Mus	.....	Eastport, Me	Jr.	26.5	11.6	7.5	4.7	2.2	3.5
13305	...do	.....	...do	Jr.	24.4	10.0	7.3	4.1	2.0	3.7
13301	...do	.....	...do	Jr.	23.7	10.0	7.1	4.0	1.9	4.0
9157	...do	.....	...do	Jr.	24.7	9.8	6.8	4.1	2.0	4.1
9078	...do	.....	Puget Sound	Ad	29.3	13.7	8.5	5.5	2.5	4.2
9077	...do	.....	...do	..	26.5	11.7	7.7	4.7	2.2	3.6
2965	Roy. Col. Surg	*P. tuberculifera* ..	Brighton, Eng.	♀	26.4	10.7	7.8	5.0	2.5	3.6
2970	...do	.....	.....	..	26.2	10.9	7.5	4.8	2.4	3.4

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Breadth of crown of largest tooth.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
9164	10.0	2.1	14.7	.....	11.9	.....	6.0	4.1	.....	.....	.....	.....	.....	{ 26—26 / 1— 1
13305	8.9	1.8	12.8	14.8	12.1	.....	.....	3.5	18.4	2.5	.....	5.0	2.6	{ 27—25 / 26—25
13301	8.6	2.0	12.6	14.5	11.3	.....	4.2	3.5	18.1	2.0	.....	4.7	3.5	{ 26—25 / 27—24
9157	8.2	2.0	12.8	.....	11.4	.....	4.6	3.6	.....	.....	.....	.....	.....	.....
9078	11.8	2.2	18.1	19.4	13.7	13.9	6.0	4.3	23.1	2.9	.....	6.4	3.5	{ 28—27 / 25—26

The type-specimen, though very young, measured 162cm in length, which would indicate that the species is larger than *P. communis*.

In the following table a part of Dr. Burmeister's measurements of the skull and exterior are placed in juxtaposition with the measurements of a male specimen of *P. communis* given by M. Fischer, and of a skull of *P. communis* from Puget Sound, in the national collection.

Measurements of the exterior.

Measurements.	*P. spinipinnis*, ♂, type (from Burmeister).	*P. communis*, male (from Fischer).
	Cm.	*Cm.*
Total length	162.0	164.0
Length of the mouth	8.5	13.0
Distance from extremity of snout to blowhole	16.0	17.0
Distance from extremity of snout to dorsal fin	90.0	72.0
Height of dorsal fin	12.5	13.0
Distance from extremity of snout to pectoral	32.0	30.0
Length of pectoral fin	26.0	19.0
Breadth of flukes	39.0	42.0

Measurements of the skull.

Measurements.	*P. spinipinnis*, ♂, type (from Burmeister).	*P. communis*. Puget Sound U. S. Nat. Mus.
	Cm.	*Cm.*
Length of the skull, from the surface of the occipital condyles to the extremity of the beak	29.0	29.3
Length from the condyles to the posterior wall of the nares	12.0	11.0
Length of the beak from its extremity to the root of the malar	12.2	13.9
Breadth of the skull between the postorbital processes of the frontal	16.2	16 6
Breadth of the foramen magnum	3.5	2.9
Height of the foramen magnum	3.7	2.7
Height of the skull, from the lower edge of the occipital condyles to the crest	11.0	11.2
Breadth of the beak at the base	8.0	8.6
Breadth of beak at middle	5.5	5.4
Breadth of the nares	3.6	3.4
Distance from the lower border of the foramen magnum to the pterygoids	11.0	9.9
Length of the alveolar border	7.0	11.8
Length of the lower jaw	21.2	23.0
Length of its symphysis	2.0	2.9
Height between the angle and coronoid process	6.0	6.3

It is probable that the skeleton of this species when known will be found to differ considerably from that of *P. communis*.

PHOCÆNA DALLII True.

Phocæna dallii, True, Proc. U. S. Nat. Mus., VIII, 1885, pp. 95-98, Pls. II-VI.

Since the publication of my description of this species the National Museum has received a second skull from Lieut. Commander H. E. Nichols, who obtained it at Hoonyah Sound, Alaska.* This specimen and the

* There is also a skull of this species (No. 3961) in the Berlin Anatomical Museum. It was obtained by Chamisso, but the exact locality is not given.

type-skull, when compared with a skull of *P. communis*, present a number of characters by which the two species are readily distinguishable. The skulls of *P. Dallii* are remarkable for their short, flat beaks and great breadth between the orbits. The intermaxillæ are higher in front of the nares than in *P. communis*, and nearly flat superiorly. The triangular area in front of the nares is raised above the level of the surrounding surface and the foramina on either side do not open into deep, narrow grooves as they do in *P. communis*. The intermaxillæ are separated at their inner margins by a wide space, and at the bottom of the trough the vomer is plainly visible. The region of the skull between the nares and the occipital crest is nearly at right angles with the plane of the beak. The nasal bones have the form of two transverse, prominent bosses. The occipital bone is exceedingly large and broad, as compared with that of *P. communis;* the temporal fossæ are small, and the squamosal are short and thick. The nares, both superior and inferior, are very large.

These differences in the skull—and they are but a few of those which are discernible—together with the differences in external appearance, separate this species very clearly from *P. communis*, and there can be no doubt that it is distinct and valid.

I repeat in this connection the measurements of the exterior given in my previous paper on this species:

Measurements of the exterior of a specimen of Phocæna dallii captured off Adakh Island, August 13, 1873.

[These measurements are in straight lines, the curves of the body being excluded.]

	Inches.
Total length	72.0
Tip of lower jaw to corner of mouth	3.5
Tip of lower jaw to center of eye	7.0
Tip of lower jaw to ear	9.5
Tip of lower jaw to front edge of pectoral at its insertion	11.0
Tip of lower jaw to back edge of pectoral at its insertion	14.0
Tip of lower jaw to anterior edge of blowhole	9.0
Eye to spouthole (vertical)	4.0
Across base of pectoral	5.5
Anterior base of pectoral to tip	8.0
Posterior base of pectoral to tip	5.75
Tip of lower jaw to anterior boundary of the white area	27.3
Spouthole to anterior edge of dorsal	18.5
Height of dorsal	6.0
Length of base of dorsal	10.5
Length posterior margin of dorsal	7.5
Tip of lower jaw to genital slit	43.0
Length of genital slit	3.0
Genital slit to anus	4.25
Anus to notch of the flukes	22.75
Breadth of flukes (transverse)	18.5
Length of flukes (antero-posterior)	5.25
Breadth of narrowest part of tail before the flukes	1.75

	Inches.
Height of body at same point	3.5
Length of eye	.75
Width of spouthole	1.87
Extension of white area posterior to the anus	6.5
Length of white area along the belly	18.0
Width of head at corner of the mouth	5.5
Depth of body 24 inches anterior to the flukes (at which point the keels are widest)	10.0
Depth 8 inches anterior to flukes	7.5
Navel to anterior end of genital slit	7.5

Measurements of two skulls of Phocæna dallii.

Measurements.	No. 21762 *P. dallii*; Adakh Id., Alaska. Type.	No. 22566 *P. dallii*; Hoonyah Sound, Alaska.
	Cm.	*Cm.*
Total length	33.3	31.4
Length of beak	14.0	12.6
Breadth of beak at base of notches	9.5	9.8
Breadth of beak at its middle	5.7	6.1
Breadth of intermaxillaries at same point	3.5	3.2
Greatest breadth between outer margins of intermaxillaries proximally	5.1	6.0
Length of tooth-line	12.7	11.9
Last tooth to base of maxillary notch	2.2	1.7
Tip of beak to anterior margin superior nasal opening	17.8	17.2
Tip of beak to end of crest of pterygoid	21.3	†19.5
Breadth between orbital processes of frontal	16.5	16.5
Breadth between hinder margins of temporal fossæ	16.2	17.2
Length of temporal fossa	5.6	4.9
Depth of temporal fossa	2.6	3.0
Total length of mandible	25.5	24.0
Length of symphysis of mandible	3.8	3.8
Length of tooth row of mandible	12.2	11.2
Depth between angle and coronoid process	5.7	6.3
Number of teeth	{23–23 / 27–27	{28–27 / 24–25

14. GRAMPUS Gray.

Grampus, Gray, Spic. Zool., 1828, p. 2; Zool. Erebus & Terror, 1846, p. 30.

GRAMPUS GRISEUS (Cuvier).

Delphinus griseus, Cuvier, Ann. Mus., XIX, 1812, p. 14, pl. 1, fig. 1.
Delphinus Rissoanus, Desmarest, Mammalogie, 1822, p. 519.
Grampus Cuvieri, Gray, Ann. Nat. Hist., 17, 1846, p. 85.
Grampus Souverbianus, Fischer, Act. Linn. Soc. Bordeaux, XXXV, 1881, p. 210.
Grampus sakamata, Gray, Zool. Erebus & Terror, 1846, p. 31.
Grampus Stearnsii, Dall, Proc. California Acad. Sci., v, 1813, p. 13.
Globiocephalus Rissii, Anon., Chinese Repos., vi, 1838, p. 411–414.
Globiocephalus Chinensis, Gray, Cat. Seals and Whales, 1866, p. 323.

M. Fischer* and Professor Flower† having discussed at length the question of the identity of *G. griseus* and *G. Rissoanus*, and having reached the conclusion that no distinction is to be made between the two nominal species, it is unnecessary for me to repeat the arguments, since

* Fischer, Act. Linn. Soc., Bordeaux, XXXV, 1881, p. 195, et seq.
† Flower, Trans. Zool. Soc., London, VIII, 1872, pp. 1–21, pls. 1, 2.

I find no reason to dissent from the opinion of these two eminent naturalists. I shall give attention, instead, to the question of the relationship of the specimens in our collection from the east coast of the United States, and to that of the identity of *G. Souverbianus* Fischer, *G. Richardsoni* Gray, and *G. Stearnsii* Dall.

The material in the national collection comprises four adult skeletons, ten skulls, a cast of an adult about 12 feet long, casts of two young individuals about 6 feet long, and of three adult heads. All these specimens are from Cape Cod, Massachusetts, whence they were received in the fall of 1875. Professor Cope has figured two of the heads and also an entire young individual (of which the cast is not at present to be found) in the Proceedings of the Philadelphia Academy (1876, Pl. III).

The large cast (No. 12839) is from a female, about 12 feet long. Its dimensions are as follows:

	Inches.
Total length (straight line)	130
Extremity of snout to eye	15
Extremity of snout to blowhole	17
Extremity of snout to corner of mouth	13
Extremity of snout to anterior base of pectoral fin	22
Extremity of snout to anterior base of dorsal fin	50
Length of pectoral fin along center	21½
Greatest width of pectoral fin	8½
Vertical height of dorsal fin	13½
Length of base of dorsal fin	22

The cast represents one side only of the body. The general color, covering the body and all the fins, resembles that of the portion of Professor Flower's figures between the dorsal and pectoral fins, viz, a steel-gray of medium depth and everywhere uniform. The lower lip and chin, the margin of the upper lip, and an area on the belly beneath the dorsal fin are of a light gray color, approaching white. The whole body and the fins are traversed by irregular lines of a light gray color and of varying width and length.

This individual, therefore, differs from that figured by Professor Flower in being more uniform in color, the light areas being more limited and the pectorals not mottled.

The outlines of the body are practically the same in the two specimens, but in ours the dorsal fin is less high and wider.

One of the casts of the two young individuals (No. 1), which is 68 inches long (on the curves), is exactly like the young specimen figured by Professor Flower, except in the following particulars: The upper parts are rather lighter, and the light color of the belly extends back of the anus half way to the flukes. The diagonal stripes are represented in our specimen by three vertical lines between the dorsal fin and the flukes. In the specimen figured by Professor Cope,* which was ob-

* Proc. Acad. Nat. Sci. Phila., 1876, pl. 3.

tained in the same locality, the diagonal lines are much like those represented in Professor Flower's figure.

The second young individual (No. 2), which is 73 inches long (along the curves), departs in color both from that figured by Professor Flower and that just described. The whole head, including the eyes and mouth, and to the blowhole, the belly, lower half of the tail and under side of the flukes, and pectoral fins are light yellowish, approaching white. On the upper part of the head and on the lower lip the tint approaches lemon yellow. The back and upper side of the flukes and pectoral fins are dark gray. On the lips and over the base of the pectoral fin are irregular areas of light brown.

The contour of the body in this specimen, however, is exactly that of the specimen previously described, and in spite of the difference in color I do not hesitate to assign them to the same species. The dimensions of the two specimens are as follows:

Measurements.	No. 1.	No. 2.
	Inches.	*Inches.*
Tip of snout to notch of flukes (on the curves)	68.0	73.0
Tip of snout to eye	8.5	10.0
Tip of snout to corner of mouth	8.0	8.75
Tip of snout to base of pectoral fin	13.0	16.0
Tip of snout to blow-hole	10.5	11.5
Tip of snout to dorsal fin	30.5	32.5
Length of pectoral along the center	9.75	10.0
Width of pectoral (greatest)	4.0	4.0
Width of flukes	14.75	14.50
Height of dorsal fin (vertical)	7.25	6.25
Length of base of dorsal fin	12.00	11.00

Both these specimens show the slight extension of the upper jaw over the lower jaw, which is characteristic of this genus as well as of *Globicephalus* and *Delphinapterus*.

One of the heads referred to is entirely of a lightish-gray color, except the throat, which is yellowish white. The two remaining heads are not at present accessible.

Of the four skeletons none, unfortunately, are absolutely complete, nor is the sex noted; they lack from one to three of the last caudal vertebræ. Their formulæ, with the additions which seem to be necessary to restore the original number of vertebræ, are as follows:

n. n. C. 7; D. 12; L. & Ca. 49 (? + 1) = 68 (or ? 69). Length as mounted, 9 feet 10½ inches.

n. n. C. 7; D. 12; L. & Ca. 46 (? + 3) = 65 (or ? 68). Length as mounted, 10 feet 3½ inches.

15771. C. 7; D. 12; L. & Ca. 48 (? + 1) = 67 (or ? 68). Unmounted.

15772. C. 7; D. 12; L. & Ca. 48 (? + 1) = 67 (or ? 68). Unmounted.

The two mounted skeletons agree very closely with that described by M. Fischer. There are some slight differences in the point at which

the chevron bones commence, etc., which are shown in the following table:

Characters.	M. Fischer's skeleton.	No. — U. S. N. M.	No. — U. S. N. M.	Professor Flower's skeleton.
Total number of vertebræ	68	65 (?+3)	67 (?+2)	68
Chevrons begin at vertebra number	43	38	39	39
Chevrons end at vertebra number	58	?58	61	59
Neural spines become obsolete at number	60	59	60	57
Transverse processes become obsolete at number	54	54	54	53
Perforations for caudal artery begin at number	47	45	46	44
Phalanges:				
First finger	?1	1	----------	1
Second finger	?7	9	----------	9
Third finger	?5	7	----------	7
Fourth finger	?1	?	----------	2
Fifth finger	?0	?	----------	0

As regards the shape of the sternum, the number and shape of the sternal ribs, the shape of the acromion and coracoid and of the hyoid bones, our two skeletons agree exactly with that described by M. Fischer.

The skulls are of all ages, the younger having the elements of the occipital bone, and likewise all the other bones of the skull separate, while in the older the sutures between the palatine and maxillary bones and the maxillæ and intermaxillæ have disappeared.

In five cases the mandible is present, and there are also in the collection two additional complete jaws. In these the number of teeth is as follows: 4–4; 4–4; 4–4; 5–4; 5–4; 5–5; 6–6; which goes to confirm the truth of the remark of M. Fischer, viz:

Il est difficile de ne pas admettre une seule espèce, dont la dentition varie entre 3–4 et 6–6.*

The proportions of the adult skull described by Professor Flower agree very closely with those of one of equal size in our Museum, as is shown in the following table (Professor Flower's measurements being for convenience reduced to centimeters):

Measurements.	Professor Flower's specimen ♀.	No. 21047, Cape Cod, Mass.
	Cm.	*Cm.*
Entire length	48.8	48.7
Length of rostrum	23.6	24.6
Breadth of occipital foramen	3.8	4.7
Greatest height of occipital foramen	4.8	5.1
Breadth of occipital condyles	11.4	11.8
Greatest breadth of cranium (at parietal region in temporal fossa)	23.1	24.0
Greatest breadth of skull (at zygomatic process of squamosals)	32.8	34.2
Breadth at anteorbital processes of frontal	30.9	31.6
Breadth of anterior nareal apertures	7.1	7.6
Breadth of rostrum at base (bottom of anteorbital notch)	19.6	20.4
Breadth of rostrum at middle	11.2	11.4

To sum up the facts presented, it may be said that our specimens agree exactly with the European ones in size, and closely in color (in a

* Fischer, l. c., p. 209.

species in which the color is very variable), in osteological details and proportions, and in the number of teeth (which number is also variable). I believe, therefor, that there can be no reasonable doubt but that the grampuses of American and European waters are identical.

Grampus souverbianus Fischer.

On page 209, M. Fischer brings together the measurements of the length of ten skulls of European specimens. The largest of these is 515^{mm} long, and as this is presumably from a full-grown male, he questions whether another skull 530^{mm} long (and having indications of teeth in the upper jaw) may not be that of a distinct and larger species. He gives this skull provisionally the name of *G. Souverbianus*. But an examination of the tables of measurements on p. 132, shows that six of thirteen American skulls measured exceed 515^{mm}, while the remaining seven stand in a practically evenly-graded series below that length. I do not think, therefore, that the skull called *G. Souverbianus* can be set apart on account of its size. Its proportions are as follows:

Measurements.	G. Souverbianus. From Fischer.	Cape Cod. G. griseus. n. n.
	Mm.	*Mm.*
Total length	530	*540
From extremity of beak to anterior wall of nasal fossa	370	390
From extremity of beak to maxillary notches	295	299
Breadth of head between the postorbital process of the frontal	375	378
Breadth of the beak at its base	235	224
Breadth of the beak at its middle	150	138

* This is measured from the inferior margin of the foramen magnum, as seems to be the case in all of M. Fischer's measurements, and not from the surface of the condyles as in mine.

The teeth in *G. Souverbianus* are 3–2; in the Cape Cod specimen, 5–4. As regards the teeth in the upper jaw Fischer remarks:

On voit des alvéoles au maxillaire supérieur, mais leur fond est partie comblé.

In all the largest skulls in the national collection there are signs of these rudimentary alveoli, but it is my opinion that they are made by the pressure of the mandibular teeth against the margin of maxillæ, and that they do not indicate the previous presence of teeth. Indeed, in skull No. 16486, in which the mandible is present, it is demonstrable that these pits are made by the mandibular teeth.

The only character, therefore, brought forward by Fischer as distinguishing the type of *G. Souverbianus* is the breadth of the beak, and no one, I think, who examines the comparative measurements on p. 132, will regard this of sufficient importance to entitle the skull to a distinct specific name. I believe it to be only an oldish individual of *G. griseus*.

Grampus Richardsoni Gray.

At first sight the measurements appear to show that this skull is separable in that it has a narrow beak and narrow intermaxillæ, but in

No. 21048 of the American series (p. 132) we find a skull which has the beak relatively as narrow and the intermaxillæ both relatively and absolutely narrower. The teeth are of the same number (4–4), and as large as in the American series.

Apparently no characters of genuine importance have been brought forward to prove the distinctness of the grampus of the Cape of Good Hope, and until such are forthcoming it seems reasonable to regard it as identical with the *G. griseus* of northern waters.

Grampus Stearnsii Dall.

A mandible and two teeth are the only specimens of the west-coast grampus in the national collection. The mandible is apparently neither the No. 1 nor the No. 2 of Mr. Dall's description;* at least I can not make my measurements agree with his. The mandible is from the same locality, however, as that from which Mr. Dall's specimens were obtained, and the teeth are of the same number (3–3) as in his No. 1. It may be that I do not interpret his measurements correctly, and that this is his No. 1. The proportions of the jaw are as follows:

Measurements.	13021. Monterey, Cal. (C. M. Scammon.)	
	Inches.	Centimeters.
Total length	17.6	44.7
Length of the symphysis	1.95	4.9
Greatest depth at the symphysis	1.7	4.3
Distance from the anterior extremity of the jaw to the end of the tooth line	2.6	6.5
Vertical depth at the coronoid process	4.75	12.0

Upon examination, it appears that the coronoid process of this jaw is a little higher than is common in *G. griseus*, and the posterior portion of the ramus is somewhat less convex, but I make this statement with all reserve, however, since I have examined only about ten jaws of *G. griseus*, and in no two of these is the form identical. I know no reason why the slight differences observable in the mandible from Monterey may not be set down as indicative of individual variation merely. The teeth are of the same size and form as in *G. griseus*. The formula for the mandible under consideration is $\frac{0-0}{3-3}$; but in Mr. Dall's No. 2 there were four teeth on each side—the average number in *G. griseus*.

From the remarks of Scammon on p. 103 of the *Marine Mammalia* it would appear that the Pacific grampus has a higher dorsal fin than *G. griseus;* but neither these remarks nor the figure on page 102 merit the serious consideration of the classifier, since Scammon's observations were made not on specimens under his hand but at liberty in the sea.

We have, therefore, only the presumption that dolphins of the same genus inhabiting different seas are likely to be specifically distinct, as the basis for the separation of *G. Stearnsii* from *G. griseus*.

* Scammon, Marine Mammalia, p. 300.

Grampus sakamata Gervais.

This name was first formally used by Gray in the Zoology of the Voyage of the *Erebus* and *Terror*, page 31. It was given to a whale described by Schlegel from Japanese drawings and natural histories. Schlegel did not see any specimens of the species described, and Gray did not examine the original accounts from which Schlegel drew his description. Certainly we are getting far away from nature in this matter. Fortunately, however, Gervais applied the name to a skull of a grampus received from Japan, and thus for the first time placed the new species, if new species it be, within the reach of investigation.

In considering this skull we ought not to be influenced by Schlegel's remarks on the color, etc., of the animal represented in the Japanese drawings, because that author believed that the cetacean was a species of Killer. Gray's opinion to the contrary notwithstanding, it does not appear probable to me that the author of the concise and well-illustrated description of the Killer in the *Abhandlungen* would mistake a Grampus for a Killer. I consider the skull figured by Gervais in the *Ostéographie* (pl. LXIV, fig. 5, p. 568) as the type of the so called *Grampus sakamata.*

Upon examining this figure, however, we are at once made aware of the inadvisability of basing species in this genus on the proportions of the skull alone, on account of the great amount of individual variation in cranial characters. Figures 4 and 5 on plate LXIV of the *Ostéographie* apparently represent skulls distinguishable specifically at a glance. But in the national collection there are two skulls which might almost have served for the basis of these two figures, yet were both obtained from Cape Cod, Massachusetts (together with many others), at the same time, and are almost unquestionably specifically identical.

We will consider a few of the proportions common to Gervais' skull of *G. sakamata* from Japan, and No. 22446 of our collection, from Cape Cod, Massachusetts, and some which are common to the skull of *G. griseus* from Concarneau, figured on the same plate, and No. 22447 of our collection, from Cape Cod. It should be remarked first, however, that both our skulls and those figured in the *Ostéographie* are from young individuals.

Proportions common to *G. sakamata* and No. 22446 U. S. N. M., from Cape Cod, Massachusetts.	Proportions common to *G. griseus* from Concarneau and No. 22447 U. S. N. M., from Cape Cod, Massachusetts.
1. Distance from left maxillary notch to extremity of rostrum equals distance from same notch to margin of maxilla, over post-orbital process of frontal.	1. Distance from left maxillary notch to extremity of rostrum equals distance from same notch to ante-orbital enlargement of frontal.
2. Length of beak equals width from base of maxillary notch to ante-orbital enlargement of opposite frontal.	2. Length of beak is less than the same width.
3. The width of the widest part of the maxillæ anterior to the notch is contained one and one-half times in the length of the beak.	3. The same width is contained one and one-fourth times in the length of the beak.
4. The greatest width of the intermaxillæ anterior to the notch is contained a little less than three times in the length from the anterior margin of the nares to the extremity of the rostrum.	4. The same width is contained but two and one-half times in distance from the nares to the extremity of the rostrum.

Unlike as these two skulls figured in the *Ostéographie* are in proportions therefore, they find their counterpart in two skulls presumably of the same species and from a single locality. It would seem that something besides proportion of the skulls must be brought forward whereby to distinguish the supposedly distinct Japanese Grampus.

I did not have an opportunity of examining the skull of *G. sakamata* when in Paris and can not affirm that it may not exhibit characters which are not represented in Gervais' figure. Until such characters are discovered, however, I do not see any reason why *G. sakamata* should be regarded as distinct from *G. griseus*.*

Globiocephalus Rissi and *G. Chinensis* Gray.

This animal, which was described by an anonymous writer in the Chinese Repository, Vol. VI, pp. 411–414, appears to be unquestionably a grampus, as is indicated by the size, the number, and the position of the teeth, and the color and markings of the skin. Gray, following Blyth, regarded it as a Blackfish, and founded his *Globiocephalus Chinensis* upon it. That it was a grampus, and probably *G. griseus*, will, I believe, be the opinion of any person who reads carefully the original description in the work mentioned.

Table of measurements.

GRAMPUS GRISEUS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxille at middle of beak.	Greatest breadth between outer margins of intermaxille proximally.
							At base of maxillary notches.	At its middle.		

Table of measurements—Continued.

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of mandibular teeth.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
16486	.....	.....	35.3	34.0	34.7	23.0	12.2	9.2	.....	.....	.....	.....	.....	.....
15890	.....	.....	35.0	33.2	34.2	24.5	13.3	6.9	...	.....	.....	.....	.....	.....
15891	.....	.....	35.3	33.6	30.8	22.3	12.3	6.5	....	....	.....	.....	.....	.....
21048	.....	.....	33.2	.....	31.8	22.5	12.4	6.9	.....	.....	.....	.....	.....	.....
21047	.....	.....	32.0	30.4	31.0	20.7	13.5	8.0	.....	.....	.....	.....	.....	.....
15894	.....	.....	29.8	.....	27.0	22.1	11.4	6.7	.....	.....	.....	.....	.....	.....
15772	.....	.....	28.4	28.6	26.0	18.7	10.7	6.2	36.2	4.7	5.5	9.0	.....	§ 0—0 ‡ 4—0
15773	.....	.....	19.1	20.5	20.1	17.1	9.5	5.1	29.0	3.1	4.6	6.7	.....	§ 0—0 ‡ 4—4
364*a*	.....	.....	27.4	.....	27.4	20.1	11.3	4.7	33.3	2.5†	5.8	9.4	.....	§ 0—0 ‡ 4—4
364*b*	....	.....	33.0	31.5	32.4	17.8	14.6	7.8	.....	.....	.....	.....	.....	.....
1626*a*	.....	.....	.....	.....	.....	.....	.....	.....	40.0	5.3	7.0	9.9	0.76	§ 0—0 ‡ 4—4
1626*b*	.....	.....	31.1	31.5	28.4	20.1	10.9	5.7	38.5	4.7	6.6	9.5	0.76	§ 0—0 ‡ 4—4

* Least. † Rudimentary alveoli closed. ‡ Rudimentary alveoli open. § Occipital sutures distinct.

15. GLOBICEPHALUS Lesson.

(*Globicephala* Lesson, Mamm. découverts depuis 1788, 1828, p. 441.)

GLOBICEPHALUS MELAS (Traill).

Dephinus melas, Traill, Nicholson's Journal, XXII, 1809, p. 81, pl. 3.
Delphinus globiceps, Cuvier, Ann. Mus. d'Hist. nat., XIX, 1812, p. 14, Pl. 1, 2 figs.
Globiocephalus Svineval, Gray, Zool. Erebus & Terror, 1846, p. 32.
Delphinus intermedius, Harlan, Journ. Acad. Nat. Sci. Phila., VI, 1829, p. 51, Pl. 1, fig. 3.
† *Globiocephalus affinis*, Gray, Zool. Erebus & Terror, 1846, p. 32.
Globiocephalus Edwardsii, A. Smith, African Zoology.
Globiocephalus incrassatus, Gray, Proc. Zool. Soc. London, 1861, p. 309, 1 fig.
Sphærocephalus incrassatus, Gray, Proc. Zool. Soc. London, 1864, p. 244; Catalogue, 1866, p. 324.

Traill's concise description and generally accurate figure leave no doubt whatever as to the identity of his *Delphinus melas*. Gray was surely at fault in employing Lacépède's name, *Catodon Svineval*, since the only part of the latter's description which is diagnostic in no way applies to the blackfish.

The generally accepted opinion that the blackfish of the northeastern coast of North America, the *Delphinus intermedius* of Harlan, is identical with the *Globicephalus melas* of European waters, seems to rest upon an excellent basis. Harlan's species was described from a specimen from

Salem, Mass. There are in the Museum collections some six or eight skulls, three skeletons, and two casts of specimens from Cape Cod, Massachusetts, and also some ten photographs of different schools which have stranded from time to time near Provincetown, at the extremity of the Cape. In external appearance the specimens photographed correspond to Harlan's description and very crude figure, and on the other hand they correspond exactly to the individuals from European waters figured by Murie, Couch, and Cuvier. All the individuals of which the under surface of the body is shown in the photographs (some twenty or more), without exception, have the peculiar white mark on the throat and median line of the belly, represented in Cuvier's figure. Harlan's statement, that the length of the dorsal fin is only one-thirteenth of the total length, seems to be based on a measurement of the figure, which is certainly incorrect as regards the dorsal. In the skeleton the vertebral formula is the same as that given by Flower for *G. melas*.* In two complete skeletons the formula is as follows: No. 14417: C. 7, D. 11, L. 14, Ca. 27=59. No. 20958: C. 7, D. 11, L. 13, Ca. 29=60.

The teeth in six skulls are as follows: $\frac{9-9}{?-?}$ $\frac{?-?}{10-10}$ $\frac{10-9}{?-?}$ $\frac{?-11}{?-?}$ $\frac{9-9}{9-9}$ $\frac{10-10}{10-10}$.

The number $\frac{9}{9}$ to $\frac{10}{10}$ would therefore appear to be the average, which s also the number commonly found in European specimens. A skull from Cape Cod presents the following proportions as compared with the specimen from Paimpol, of which measurements are given by Fischer, p. 188:

Measurements.	Skull from Cape Cod.	Specimen from Paimpol.
Total length	61.0	61.0
Extremity of beak to anterior margin superior nares	42.3	41.0
Extremity of beak to maxillary notches	34.1	32.0
Breadth of cranium between post-orbital processes of frontal	43.0	43.0
Breadth of beak at base	23.6	24.0
Breadth of beak at middle	18.0	19.0

Measurements of other specimens from Cape Cod will be found in the table on p. 136.

There seems to be on the whole no good reason for considering the blackfish of New England as specifically distinct from that of European waters.

Globicephalus affinis Gray.

This species is founded on a single skull, No. 2999, in the College of Surgeons. The locality from whence it was derived is unknown. The skull, which is 62.5^{cm} long and has the teeth $\frac{11-11}{12-12}$, seems to differ from the ordinary *G. melas* simply in having the intermaxillæ somewhat

* P. Z. S., 1883, p. 508.

broader than is common in that species and in being a little narrower across the orbits. It is doubtful whether these differences entitle it to rank as a distinct species. The proportions of the skull are given in the table on p. 136.

Phocæna Edwardsii A. Smith.

Sir Andrew Smith described this species from a drawing and description of E. Verreaux.* The description is partially made up of generic characters, and is also in part contradictory. For example, the sides are said to be black in one sentence, and in the next, white. The teeth are stated to be $\frac{12-12}{12-12}$, the entire length of the body $12\frac{1}{2}$ feet, the circumference in front of the dorsal $6\frac{3}{4}$ feet, and the breadth of the flukes $2\frac{3}{4}$ feet. The breadth of the flukes, according to these measurements, equals 21.9 per cent. of the total length. In D. Murie's specimen† the same breadth is 20.8 per cent. of the total length, and in the Paimpol specimen cited by Fischer (l. c., p. 187) 22.4 per cent. Since Smith's specimen is intermediate between the other two, and the percentage of the breadth of the flukes to the total length is intermediate between the percentages furnished by the other two specimens, it is evident that this measurement, which is practically the only tangible character given, is of no significance as distinguishing the supposed species from *G. melas*.

Furthermore, M. Fischer has shown (l. c., p. 193) that a blackfish identical with the *G. melas* of European waters occurs about the Cape of Good Hope, and finally Gray, who had Verreaux's original drawing, states that "it is very like *Globiocephalus Svineval* of the European seas" (*Catalogue*, p. 325). M. Fischer is therefore perfectly justified in his assertion:

> Il est donc probable que le *G. melas* se montre sur toute la côte ouest d'Afrique jusqu'au Cap, et que le nom de *G. Edwardsi* doit passer en synonymie.‡

The Globicephalus of New Zealand waters.

In his *Notes on New Zealand Whales*, in Vol. VII of the Transactions of the New Zealand Institute, p. 261, Dr. Hector describes, under the name of *G. macrorhynchus*, Gray, the blackfish common of New Zealand seas. But it is evident from the description and figures (l. c., Pl. XVI, figs. 3 and 3*a*) that this is not *G. macrorhynchus*, but rather a species closely resembling, or identical with, *G. melas*. Professor Flower, who has examined skeletons of the New Zealand form, finds nothing whereby to distinguish it from *G. melas* (*Characters and Divisions*, p. 509).

Sphærocephalus incrassatus Gray.

There is apparently no reason to doubt the generally accepted opinion that this species, founded on a water-worn skull, is identical with *G. melas*.

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* African Zoology. † Trans. Zool. Soc. London, VIII, pp. 240, 241. ‡ L. c., p. 194.

Globicephalus propinquus Malm.

This species was founded on a fœtus 315mm long, which had been in alcohol twenty-one years at the time it was described by Malm.* That writer states that it is distinguished from *G. melas* by the possession of a slightly greater number of vertebræ and phalanges. The number given in each case, however, is within the limit of variation of *G. melas*, and no importance, therefore, attaches to these supposed characters.

Furthermore, the present writer is of the opinion that the classifier is under no obligation to seriously consider species founded upon fœtal specimens.

The remarks of Commander Natt och Dag upon the adult from which the fœtus in question was taken are based merely on his remembrance of the appearance of the specimen and are of no value in identifying the species.

Table of measurements.

GLOBICEPHALUS MELAS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
							At base of maxillary notches.	At its middle.		
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
12098	U. S. Nat. Mus.	.....	Cape Cod	Ad.	62.6	31.8	*23.5	17.8	15.7	14.5
14361	....do	.....	....do	Ad?	61.8	30.9	*23.7	18.3	15.5	15.5
12097	....do	.....	....do	Ad.	62.4	31.3	*23.0	17.6	15.4	15.8
12100	....do	.....	....do	Ad.	65.5	33.4	*24.0	19.4	15.4	16.3
20950	....do	.....	....do	Jr.	54.1	25.5	18.3	13.8	11.9	13.7
20957	....do	.....	....do	Jr.	49.4	23.1	16.1	11.3	10.4	12.5
2999	Roy. Coll.	*G. affinis*	.....	....	62.5	31.8	23.1	19.1	15.5	14.7?

[redacted]

Table of measurements—Continued.

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.					
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
12098	15.6	18.8	42.8	41.0	40.0	31.4	12.2	9.1	.....	.....	.....	.....	$\frac{9-9}{?-?}$
14361	....	.....	41.7	42.3	39.2	26.9	15.1	9.4	.....	.....	.....	.....	$\frac{?-?}{10-10}$
12097	15.1	19.2	.....	42.5	39.3	28.9	12.9	7.2	.....	.....	.....	.....	$\frac{10-9}{?-?}$
12100	18.4	17.2	45.3	45.7	42.3	29.7	17.3	9.6	.....	.....	.....	.....	$\frac{?-11}{?-?}$
20950	13.8	13.5	34.9	35.6	32.3	24.9	12.1	7.1	21.8	5.8	12.2	12.4	$\frac{10-10‡}{10-10}$
20957	11.5	14.0	31.9	31.7	28.4	23.9	12.0	6.5	.....	.....	10.6	10.8	$\frac{9-9‡}{9-9}$
2999	17.0	15.5	41.9	42.5	37.7	26.7	14.0	7.2	49.3	6.1	14.9	13.9	$\frac{11-11}{12-12}$

* Least. † Posterior to the notch. ‡ Artificially set (?).

We pass now from the species which have a whitish band along the belly to those which are entirely black. In three instances (*G. scammoni* Cope, *indicus* Blyth, and *brachypterus* Cope) it has been shown that individuals entirely black had the intermaxillæ expanded distally so as to cover the anterior half of the beak. Two other nominal species (*G. macrorhynchus* Gray and *G. guadaloupensis* Gray) are known only from skulls, but as these have the premaxillæ expanded we may presume that the individuals from which they were derived were also entirely black.

GLOBICEPHALUS INDICUS Blyth.

Globicephalus indicus, Blyth, Journ. Asiat. Soc. Bengal, XXI, p. 358. (*Fide* Blyth); Journ. Asiat. Soc. Bengal, XXVIII, 1859, p. 490.

This species is only known to me from the account in Vol. XXVIII of the Journal of the Asiatic Society of Bengal. The color is stated to be "uniform leaden-black, slightly paler underneath." The intermaxillæ are expanded. The dorsal and lumbar vertebræ taken together number one more than is usual in *G. brachypterus* and one less than in *G. melas*, but this is a character of no value.

The measurements of the exterior are few in number and do not indicate specific distinctness.

Until the type-skeletons in the Calcutta Museum have been more fully described it will be impossible to determine the validity of this species.

GLOBICEPHALUS MACRORHYNCHUS Gray.

Globiocephalus macrorhynchus, Gray, Zool. Erebus and Terror, 1846, p. 33; Cat. Seals and Whales, 1866, p. 320.

This species is founded on a single skull, No. 3000, in the Royal College of Surgeons, London, to which institution it was presented by F. D. Bennett. The locality from which it was derived is unknown.

I regret to find that I made no notes upon this skull and have only my measurements for comparison. As the skull is a youngish one I do not trust myself to draw any conclusions from the consideration of the measurements alone.

In his paper on the *Delphinidæ*, Professor Flower is inclined to believe, though with some hesitation, that the blackfish skulls with broad intermaxillæ all belong to the same species. I have since satisfied myself, however, that two forms, *G. brachypterus* Cope and *G. scammoni* Cope are perfectly distinct, and the question now arises whether either of these species is identical with *G. macrorhynchus*. As I neglected to take notes upon the type-skull, I am, unfortunately, unable to throw any light on this question. The measurements which I took are subjoined:

Table of measurements.

GLOBICEPHALUS MACRORHYNCHUS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
							At base of maxillary notches.	At its middle.		
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm*	*Cm.*
3000	Roy. Coll.	*G. macrorhynchus*	South Seas	Ju.	58.5	20.5	24.0	20.6	10.8	16.0

GLOBICEPHALUS SCAMMONI Cope.

Globiocephalus Scammoni, Cope, Proc. Acad. Nat. Sci. Phila., 1869, p. 21.

This species was made known by Professor Cope from the description, measurements, and drawings of Scammon.

There is in the national collection a skull presented by Scammon which is presumably the type of the species. This skull I have compared with those of *G. brachypterus*, and, as already stated, have reached the conclusion that the differences observable indicate specific distinctions between the blackfish of the east and west coasts.

Scammon's measurements of the exterior also differ from those obtained from specimens from the east coast. These differences will be pointed out when treating of *G. brachyypterus.*

GLOBICEPHALUS BRACHYPTERUS Cope.

G. ? sp. nov., Cope, Proc. Acad. Nat. Sci. Phila. 1866, p. 8.
Globiocephalus brachypterus, Cope, Proc. Acad. Nat. Sci. Phila., 1876, p. 129.

As early as 1866 Professor Cope entertained the opinion that two distinct species of blackfish occurred on the east coast of the United States, and in 1876 he was enabled to demonstrate the validity of his opinion by the acquisition of a complete female specimen from Delaware Bay. This specimen, with the skull formerly referred to as "Globiocephalus? n. sp.," became the basis of his *Globiocephalus brachypterus.*

Recently, as already stated on a previous page, the Smithsonian Institution has received three skeletons and an additional skull, which in the opinion of the writer may undoubtedly be referred to the species under consideration. Two of these skeletons and the extra skull were obtained by Mr. Joseph Willcox in Osprey, Fla., and the third skeleton came from the U. S. Life-Saving station at Dam Neck Mills, near Cape Henry, Virginia. The Florida skeletons were respectively about 17 and 18 feet long, and the Virginia specimen (a male) measured 15 feet 3 inches in the flesh. The following external measurements were taken from the Virginia specimen while fresh, by Mr. T. W. Scollick:

Measurements of blackfish, G. brachypterus, No. 22561, male, from Dam Neck Mills, Virginia.

	Ft.	In.
Tip of snout to notch of flukes	15	3
Tip of snout to blowhole	1	9½
Tip of snout to eye	1	9½
Tip of snout to anterior base of pectoral	3	
Tip of snout to anterior base of dorsal	3	11½
Tip of snout to anus	10	5
Tip of snout to penis	9	2
Length of pectoral, straight, from middle of base to tip	2	6
Greatest breadth of pectoral		10
Length of base of dorsal	2	7
Vertical height of dorsal	1	2

	Ft.	In.
Flukes from tip to tip	3	10
Length of mouth	1	3½
Length of eye		1½
Length of caudal ridge extending upward from notch of flukes	4	4
Vertical height		3
Greatest width of caudal region at a distance of 3 feet 1 inch from notch of flukes	2	3

The vertebral formula in this specimen and in the 18-foot skeleton from Florida is as follows:

Male. Dam Neck Mills, Va. C. 7; D. 11; L. 11; Ca. 28=57.
Sex? Osprey, Fla. C. 7; D. 10; L. 12; Ca. 26 (?+2)=55 or 57.

Measurements of the skulls of all the specimens will be found in the table on page 142.

The color in every case was entirely black, and the premaxillæ cover the maxillæ in the distal half of the beak.

On comparing the skulls of these specimens with that of *G. scammoni* (No. 9074) numerous differences were found which made it apparent that *G. brachypterus* and *G. scammoni* could not be regarded as specifically identical. In *G. brachypterus* the intermaxillæ project beyond the free margin of the maxillæ, which margin is quite deeply grooved. In *G. scammoni*, on the contrary, the intermaxillæ do not extend quite to the margin of the maxillæ. This difference in the disposition of parts can not be regarded as an age character, since the skull of *G. scammoni* is the older.

In *G. scammoni*, again, the greatest enlargement of the intermaxillæ occurs at the junction of the proximal and second fourths of the distance from the maxillary notch to the extremity of the beak, while in *G. brachypterus* the length from the maxillary notch to the point of greatest enlargement of the premaxillæ is contained only about two and a half times in the length of the beak.

The rugosities near the distal extremity of the premaxillæ are very strongly marked in the skull of *G. scammoni*, but only slightly in any of the skulls of *G. brachypterus*. As the largest skull of the latter species is certainly from an adult animal it is improbable that this difference is entirely due to age.

In both the older and younger skulls of *G. brachypterus* the nasal septum is ossified so as to stand above the plane of the adjacent intermaxillæ, which is not the case in *G. scammoni*.

The skulls of *G. brachypterus* are also distinguished from that of *G. scammoni* in having the beak longer and narrower, the blowhole narrower and placed further back, the width at the orbits greater and the temporal fossæ considerably larger.

The external characters considered by Professor Cope to be diagnostic of *G. brachypterus* are (1) the length of the pectoral fin, and (2) the anterior position of the dorsal fin.

As regards the length of the pectoral fin, I find by comparing the

measurements of the type specimen and the Dam Neck Mills specimen of *G. brachypterus* with those given by Scammon for *G. scammoni* (Marine Mammalia, p. 86), that the pectoral fin was relatively shorter in the two former individuals than in Scammon's specimen. In the latter the length of the pectoral fin is 18.3 per cent. the total length, while in the type of *G. brachypterus* it is 16.4 per cent., and in the Virginia specimen of the same species, 16.9 per cent.

The distance from the extremity of the head to the anterior base of the dorsal fin in the type of *G. brachypterus* as given by Professor Cope, is relatively less than in any other blackfish of which I have examined the record. It equals 24.6 per cent. of the total length. In the Virginia specimen the distance to the dorsal is 25.9 per cent. of the total length; in *G. scammoni* it is 29.0 per cent. Here again, therefore, the two specimens of *G. brachypterus* agree with one another and contrast with *G. scammoni*, the dorsal fin being nearer the head in the two former specimens than in the latter.

In the breadth of the flukes we find the same relationship retained. The flukes are broader relatively in both specimens of *G. brachypterus* than in *G. scammoni*. In the latter they equal 22.6 per cent. of the total length, in the type of *G. brachypterus* 25.1 per cent., and in the Virginia specimen of the same species, 28.6 per cent.

Though I am convinced that there is very considerable variation in the proportions of parts in individuals of the same species, I nevertheless think that the differences shown in the percentages given above, may be taken as supplementing the differences observable in the skull, in distinguishing the east-coast blackfish from the west-coast blackfish.

No specimens of *G. brachypterus*, so far as I am aware, have been taken north of Delaware Bay, while on the other hand there are no records indicating that *G. melas* ranges farther south than Long Island, New York. The southern limit of the range of *G. brachypterus* is not determinable at present. It is probable that the species is found throughout the Gulf of Mexico and also the West Indies, if we may take into consideration a skull in the Paris Museum from Guadaloupe Island, and which is the basis of

Globiocephalus guadaloupensis Gray.

This skull is figured in the *Ostéographie* (p. 556, pl. 52, fig. 3), under the name of *G. intermedius*. It appears, however (to judge by the figure cited), to be identical with *G. brachypterus*. If there are specific differences they are yet to be pointed out. Gray, as already stated, made this skull the type of a new species or rather subspecies, *G. guadaloupensis* (Suppl. Cat. Seals and Whales, 1871, p. 84). He, however, gave no description of it, but merely cited Gervais' figure.

Measurements of four skulls of Globicephalus brachypterus and one skull of G. scammoni (probably the type).

Measurements.	G. brachypterus.				G. scammoni.
	Dam Neck Mills. ♂ 22561.	Osprey, Fla.			
		22571.	22570.	22572.	9074.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*
Total length	66.2	61.2	68.6	69.0	69.6
Length of the beak	33.3	31.6	34.0	35.3	31.0
Width of beak at its base	28.8	26.2	31.5	31.7	30.8
Width of beak at its center	23.5	23.1	24.0	26.9	25.2
Width of intermaxillæ at same point	22.9	23.0	24.0	27.4	23.6
Extremity of beak to blowhole	46.0	41.5	48.1	47.7	44.8
Extremity of beak to pterygoid	45.2	42.2	46.4	47.9	45.5
Length of tooth line	18.3	15.1	17.4	18.3	20.2
Width of skull at the orbits	45.0	42.2	49.0	51.2	48.7
Width of blowhole	9.0	8.5	10.0	9.6	10.8
Length of temporal fossa	16.3	14.6	17.2	19.0	14.8
Depth of temporal fossa	10.2	9.7	11.0	12.3	9.0
Number of teeth	7-8	8-8	9-8	8-8	8-8
				8-8	

GLOBICEPHALUS SIEBOLDII Gray.

Delphinus globiceps, Schlegel, Fauna Japon., Mammalia, 1844 (?), p. 17, p. 27, figs. 1–4.

Globiocephalus Sieboldii, Gray, Zool. Erebus and Terror, 1846, p. 32.

I should be inclined to pass over this species as founded upon too young a specimen to be seriously considered, were it not that in Schlegel's figure of the exterior at least one peculiar character is indicated. This character relates to the shape of the pectoral fin. In other species the pectoral fins come gradually to an acute termination, but in Schlegel's animal they are represented as being fully one-half as broad immediately behind the extremity as across the middle. This gives the fins an entirely different appearance from those of the other species. If the figure is correct, and if the character proves constant, Schlegel's specimen must be regarded as belonging to a distinct species. The animal was so young that the characters of the skull are not of great importance. The extremity of the vomer has the appearance of being bifurcated, one-half being applied to the wall of either intermaxillary bone. This disposition of parts is found in the species of some genera, but not in other species of *Globicephalus*.

Resting upon so insufficient a basis, the species must be looked upon as of doubtful value, until more specimens from the waters of Japan have been acquired and studied. It will very probably prove to be identical with *G. scammoni*, to which its uniformly black coloration and expanded intermaxillæ show it to be allied.

Globiocephalus australis and sibo, Gray.

Globiocephalus australis is merely a name inserted by Gray in the Supplement to the Catalogue of Seals and Whales (p. 85). It was never described.

Globiocephalus sibo, which appears in the same work (l. c.), is a name attached by Gray to an unrecognizable cetacean, stated by Schlegel in the *Fauna Japonica* to be considered by Japanese writers a variety of the blackfish. It should be expunged.

16. PSEUDORCA Reinhardt.

Pseudorca, Reinhardt, K. Dansk. Videns. Selsk. Forhandl., 1862, p. 151.

This genus is sufficiently well distinguished from *Orca*, its nearest ally, by its small dorsal fin, pointed pectorals, short alveoli, closely approximated pterygoids and other characters, pointed out by Reinhardt and Professor Flower, to merit a separate generic appellation.

PSEUDORCA CRASSIDENS (Owen).

Phocæna crassidens, Owen, British Fossil Mammals and Birds, 1846, p. 516.
Orca crassidens, Gray, Zool. Erebus & Terror, 1846, p. 33; Catalogue of Cetacea, 1st ed., 1850, p. 94.
Pseudorca crassidens, Reinhardt, K. Dansk. Videns. Selsk. Forhandl., 1862, p. 151.
Orca meridionalis, Flower, Proc. Zool. Soc. London, 1864, p. 420.
Orca destructer, Cope, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 293.
Globiocephalus Grayi, Burmeister, Anales Museo Pub. Buenos Aires, I, 1864–'69, p. 367, Pl. XXI.

According to Professor Flower, the subfossil specimen which formed the type of this species, from the Lincolnshire fens, is lost.* We have, therefore, only Sir Richard Owen's description and figures to guide us in identifying other specimens with the type. An examination of these leaves little room for doubt that Reinhardt's specimens were specifically identical with Sir Richard Owen's type. Professor Flower has also recently stated his opinion that the form previously described by him under the name of *Orca meridionalis* is identical with that described by Reinhardt. The former writer has had greater opportunities than myself for the comparison of specimens of this species, but my own more limited studies lead me to concur in his opinion regarding the specific identity of all the specimens of the genus thus far acquired.

Of four skulls in the Royal College of Surgeons, Nos. 2984, 2985, 2986, 2987 (respectively, 58.04^{cm}, 59.4^{cm}, 58.4^{cm}, 51.05^{cm}), No. 2985, which is the largest, is much the heaviest, having a rounded broad, snout and strong ridges about the temporal fossæ. The maxillary and malar bones at the notch are especially thickened. The triangular prenareal region is concave in No. 2987, the youngest specimen, but is flatter in different degrees in the other skulls. The strength of the ridge forming the posterior margin of the temporal fossa increases greatly from its condition in No. 2987, the youngest specimen, to No. 2985, the oldest, so that the distance between the margins of the fossæ is absolutely greater in the smaller skull. The pterygoids in these skulls are slightly separated

* Flower, Cat. Osteol. Specimens in R. Coll. Surg. London, Part II, Mammalia, 1884, p. 573.

by the palatines, as is also the case in the skull figured by Messrs. Van Beneden and Gervais (*Ostéog.*, Pl. L, fig. 1*a*). In a skull in the national collection, now to be described, they are practically in contact.

In examining the skulls of killer-whales in the National Museum, I have found a complete cranium, a mandible, and a beak with the teeth in position, which belong to this species. The cranium was obtained from the Athenæum Museum, Nantucket, Mass., and is stated to have come from the "northeast coast." Very probably it was originally obtained in Davis' Strait. It closely resembles the skull of *P. crassidens* figured by Reinhardt, both in proportions and details of structure, and differs only in having a somewhat shorter tooth-row.

In the four skulls in the Royal College of Surgeons the proportional length of the tooth-row varies somewhat, being 33.9 per cent. of the total length in one instance, and 36.7 per cent. in another, so that I do not regard the shorter tooth-row of the skull under discussion as worthy of special consideration.

In the following table are given measurements of this skull, together with Reinhardt's measurements (reduced to English inches) of the Refsnæs specimen, and as many of Burmeister's measurements of *Globiocephalus Grayi* (presently to be considered) as may be compared with the former:

Measurements.	U. S. Nat. Mus., No. 10320. "Northeast coast."	Skull from Refsnæs (from Reinhardt).	*G. Grayi* (=*P. crassidens*), from Burmeister.
	Inches.	*Inches.*	*Inches.*
Length of the head, measured from the occipital condyles to the tip of beak	24.5	24.7	24.8
Length of head, measured to the middle of the inferior margin of the occipital foramen	23.9	23.9	.....
Length of the cranial portion, measured from the occipital condyles to the posterior wall of the nasal canal	9.75	9.0	8.4
Length of the beak, measured from its origin on a level with the anterior extremities of the zygomatic bones	11.0	11.3	†12.8
Greatest breadth of the head (across the zygomatic processes of the temporal bones)	15.0	15.3	.....
Breadth of the head across the postorbital processes of the frontals	14.75	14.7	15.6
Breadth across the occipital ridge at its union with the temporal ridges	8.5	9.3	.....
Breadth across the prominences formed by the frontals, the superior maxillaries and the zygomatic bones in front of the orbit	13.1	13.4	.....
Breadth of the beak at its origin	8.2	8.5	9.2
Breadth of the beak towards the middle, just before the most posterior tooth but two	7.7	8.0	7.6
Height of the occipital foramen	2.5	2.3	2.2
Breadth of the occipital foramen	2.55	2.2	2.0
Distance from the inferior margin of the occipital foramen to the posterior margin of the pterygoid bones	8.2	8.4	8.4
Length of the dental row in the upper jaw	8.85	10.5	10.9

Orca destructor Cope.

The beak and mandible referred to (No. 3679) are from off Paita, Peru, and form the basis of Professor Cope's *Orca destructor*. He states that it differs from *P. meridionalis* "in the greater breadth and obtuseness of the muzzle of its cranium and mandible—all we possess of it—

and in the smaller number of teeth; the premaxillary bones are relatively narrower throughout the greater part of their length."* As regards the breadth of the beak anteriorly, it should be stated that the skulls of *P. meridionalis* described prior to the date of Professor Cope's writing were young, while the beak under consideration is from an old individual, as is shown by the partial anchylosis of the premaxillæ with the maxillæ, and the worn condition of the teeth. The teeth in this specimen are $\frac{8-8}{9-9}$, and exceed, therefore, the number in one of the specimens of *P. meridionalis* (No. 2984) in the Royal College of Surgeons, in which the number is $\frac{8-8}{8-8}$. As regards the posterior tooth "being the last of the maxillaries, instead of the mandibulars, as in *meridionalis*," I do not think any cetologist would insist upon this as a specific character. The last maxillary tooth was evidently the farthest back in the skull from the northeast coast in the National Museum, and is so in the skull figured by Van Beneden and Gervais (*Ostéog.*, Pl. L, figs. 8 and 8*a*). I can not regard the specimen as other than *P. crassidens*. The proportions of the mandible and beak are as follows:

Measurements of No. 3679. Off Paita, Peru.

	Inches.
Greatest length of mandible	20.75
Length of symphysis	3.8
Length of tooth row	9.0
Depth between angle and coronoid process	6.1
Breadth of beak in front of third tooth (counting from posterior end of row)	8.25
Breadth of intermaxillæ at same point	5.6
Length of tooth row	8.4

Globiocephalus Grayi Burmeister.

Gervais† and Reinhardt‡ have already expressed their belief in the identity of this species with *P. crassidens*, and there is apparently no reason for dissent from their opinion. It has one tooth more above on each side than is common, and all the teeth are very much worn, though the skull differs in length from No. 10320 in the national collection by only three-tenths of an inch. In the characters pointed out by Burmeister in his monograph as peculiar to this skull, it agrees with the specimens of *P. crassidens* which I have examined.

Pseudorca? mediterranea Giglioli.

Professor Giglioli describes in the Zoologischer Anzeiger (V, 1882, p. 289) under this name a species found in the Mediterranean.

He gives, however, no characters by which its relationships can be determined. The teeth are $\frac{8}{8}$ or $\frac{10}{10}$. The total length of the skull in the Royal Zoological Museum in Florence is 61^{cm} long; its greatest breadth is 46^{cm}.

* Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 293.

† Gervais, Journ. de Zoologie, I, p. 68; Journ. de Zoologie, II, p. 36. Ostéographie des Cétacés, p. 548.

‡ Reinhardt, Videns. Meddel. Natur. Förening.

Table of measurements.

PSEUDORCA CRASSIDENS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak.		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
							At base of maxillary notches.	At its middle.		
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
2986	R. Col. Surg.	*O. meridionalis*	Tasmania.....	....	58.5	29.2	18.6*	14.6	11.2	11.9†
2985	....do	.....	....do	Old	59.5‡	28.7	20.8	18.8	13.2	13.2†
2987	....do	.....	....do.§	Jr.	51.1	24.2	16.0	13 0	8.3	10.4†
2984	....do	.....	Adventure Bay, Tasmania.	Jr.	58.1	27.2	18.6	15.0	10.9	12.2†

Catalogue number.	Length of tooth line.	Last tooth to base of maxillary notches.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth row of mandible.	Depth between angle and coronoid process.		Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*		
2986	19.8‖	7.9	36.2*	40.0	29.5	20.2	17.0	11.2	47.6	9.5	23.4‖	13.1	.....	$\frac{8—8}{10—10}$
2985	21.8‖	6.7	35.6*	41.3	33.3	22.6	19.1	14.7	50.8	7.0	23.9‖	14.8	.....	$\frac{9—9}{10—10}$
2987	18.3‖	5.8	29.7	34.8	26.7	21.6	15.0	9.7	41.3	7.6	20.1‖	10.9	.....	$\frac{8—8}{10—10}$
2984	20.3‖	6.9	33.7	37.5	29.6	20.6	17.8	12.7	46.0	8.1	19.3‖	13.2	.....	$\frac{8—8}{8—8}$

* Least. † This is back of the notch; the intermaxillæ are wider in front of it. ‡ A little sawed off.
§ *O. meridionalis*. ‖ Actual; not from tip of beak.

Prior to the year 1865 naturalists seemed to have been pretty well agreed that there existed but one species of white whale, the "beluga," "wittisch," or "weissfisch." We must except Gray and Desmarest, however, the former having erected *D. Kingii* on a specimen supposed to have come from New Holland, and the latter having made a distinct species of Duhamel's Dauphin blanc du Canada (*D. canadensis*). Of these species more will be said subsequently.

In 1865 Professor Cope, having studied the material brought back by Drs. Hayes and Kane, divided the genus into three sections from osteological characters, and assigned *B. rhinodon* and *catodon* to the first, *declivis* to the second, and *concreta* to the third.

Upon examination of the diagnosis it appears that the same characters, thirty-six in number, are, with eight exceptions, repeated in two or more species in different combinations. Thus *rhinodon* and *declivis* have the vomer well developed between the palatines, while *concreta* has not. On the other hand *declivis* and *concreta* have the beak one-half the total length of the skull, but *rhinodon* not. Of five skeletons in the British Museum and at Oxford none exhibit the same combination of characters exhibited by any of Professor Cope's species, nor did any two agree together. Thus No. 367*a* (British Museum) has the palatines barely in contact, a character peculiar to *rhinodon*, but it has also the beak equally one-half the length of the skull, and the teeth 9–9, which is not the case in *rhinodon*. No. 268*a* has three characters of *catodon*, but has the muzzle less than one-half the length of the skull, and the vomer well developed between the palatines, which is not the case in *catodon*.

It therefore appears that each of these five specimens must be regarded as the type of a new species, or the divisions of the original species, *D. leucas*, must be broken down; for the former course there is apparently no warrant.

Let us examine the characters themselves. The first character of Professor Cope's sections relates to the cervical vertebræ. In section *a* and *aa* those vertebræ are separated, in *aaa* the axis and third vertebra are anchylosed together. It is doubtful whether this is anything more than an individual variation. In a skeleton in the national collection the third cervical is anchylosed to the axis on the left side, but not on the right side; the area of attachment is small. In one of two skeletons of *L. acutus* now on my tables, the first three cervicals are united by the centra, and the first four by the spines, the remaining cervicals being free; in the second skeleton the first three cervicals are united by the centra, and the first five by the spines, while the sixth and seventh cervicals are also united together by their neural arches and spines.

Such variations in the amount of anchylosis of the cervicals are of frequent occurrence in this and other species of the *Delphinidæ*, and certainly do not indicate specific diversity. The presence or absence of a

vertebrarterial canal is likewise an individual character. The variation of one in the number of pairs of ribs is not considered of specific importance. The shortness of the muzzle in *rhinodon* is doubtless due to the immaturity of the specimen. The amount of expansion of the vomer and palatines in the median line is a character which varies greatly with age. The question of the number of teeth presents some difficulties. I have never seen a white whale skull with so few as four or six teeth. The number in twelve skulls in the Museum varies from eight to eleven.

As regards the relative positions of the anterior extremity of the exposed prenareal portion of the maxilla and the maxillary notch it may be said that in the twelve skulls mentioned above this part of the maxilla appears at different points from almost exactly opposite the notch to a point about midway between the line of the notches and the superior nares.

On the whole I am inclined to reunite all of Professor Cope's species under the original name and to hold that in the Arctic seas, at least, but one species of white whale has been discovered.

As regards Gray's *D. Kingii*, reported to have come from New Holland, it can only be said that considering that no white whale has been observed in the South seas, and that the type skull agrees with others from northern waters, there is strong probability that the locality given by Gray is erroneous. There is a skull in the national collection from Pastolik, Alaska, near the mouth of the Yukon, which agrees almost exactly with the type of *D. Kingii*. In both the length of the beak is about 40 per cent. of that of the skull, the breadth at the notch is a third of the total length, and the breadth of the intermaxillæ at the middle of the beak equals the distance from the last tooth to the maxillary notch.

Of Desmarest's *Delphinus canadensis*, founded on Duhamel's *Marsouin blanc*, little need be said. Duhamel states that he never has himself seen this animal nor any of the other porpoises which he figures. His words are:

> Enfin on m'a envoyé de Canada, sous le nom de *Marsouin blanc*, de douze pieds de longueur, le dessein (fig. 4), qui avait le museau très petit et le front fort élevé.*

In the explanation of the plates he says:

> Celui, fig. 4, est nommé *Marsouin blanc*, à cause de la couleur de sa peau; il a le front très-gros.†

All of Duhamel's figures of porpoises are very incorrect, and his representation of the white whale resembles that animal perhaps as much as those of the killer and the bottle-nose resemble those species. It is unwise to give such obviously inaccurate figures serious consideration, and it is certain that in the light of present knowledge, Desmarest would not have erected a species on the *Marsouin blanc*.

* Duhamel, Traité des Pesches, vol. iv, pt. 2, sect. x, Chap. II, 1782, p. 41 (Pl. x, fig. 4).

† L. c., p. 64.

Table of measurements.

DELPHINAPTERUS LEUCAS.

Catalogue number.	Collection.	Type of—	Locality.	Sex and age.	Total length.	Length of beak.	Breadth of beak—		Breadth of intermaxillæ at middle of beak.	Greatest breadth between outer margins of intermaxillæ proximally.
							At base of maxillary notch.	At its middle.		
					Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
7535	U. S. Nat. Mus	.....	Pastolik, Alaska	...	40.0	16.4	13.3	7.3	4.7	9.8
2958	R. Col. Surg	.....	.....	...	55.3	26.4	18.3	9.9	5.6	11.7
2962	....do	.....	.....	...	59.2	30.2	18.5	12.2	5.3	11.8†
2960	....do	.....	.....	...	54.4	25.4	16.5	9.5	?5.0	11.3†
2961	....do	.....	.....	...	53.1	24.8	16.8	9.4	4.5	10.9†
367*c*	Brit. Mus	.....	Eschscholtz Bay	...	50.8	25.4	16.3	8.6	4.7	10.7
367*d*	... do	.....	Greenland	Jr.	37.1	13.2	10.5	6.1	3.6	9.0
367*a*	....do	.....	....do	...	63.5	32.4	20.6	14.8	6.0	12.5
368*a*	Brit. Mus	*D. Kingii*	New Holland	...	36.0	14.0	11.9	7.1	4.1	8.9

Catalogue number.	Length of tooth-line.	Last tooth to base of maxillary notch.	Extremity of beak to—		Breadth between—		Temporal fossæ.		Length of mandible.	Length of symphysis of mandible.	Length of tooth-row of mandible.	Depth between angle and coronoid process.	Diameter of largest tooth.	Number of teeth.
			Anterior margin of superior nares.	End of crest of pterygoid.	Orbits.	Hinder margins of temporal fossæ.	Length.	Depth.						
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	
7535	13.0	4.6	24.0	23.7	20.1	.....	.....	6.0	.....	.....	.....	.....	.....	.....
2958	18.7	7.9	38.5	36.5	27.2	18.5	15.2	6.6	41.9	7.4	17.0	10.4	.....	10—10 9—9
2962	24.4	7.1	40.8	40.8	29.0	20.0‡	18.2	9.9	.....	.....	.....	.....	.....	9—9 ?—?
2960	20.0	6.5	36.0	35.3	25.4	20.1‡	15.7	8.4	.....	.....	.....	.....	.....	9—9 ?—?
2961	18.3	7.6	35.6	34.0	25.7	19.4‡	15.4	7.1	40.0	6.5	18.7	9.9	.....	7—8 9—9
367*c*	19.3	5.8	33.7	34.3	23.6	21.3§	14.0	7.4	.....	.....	.....	.....	.....	9—9 ?—?
367*d*	10.2	4.6	20.1	19.8	18.0	20.0§	.....	6.1	24.9	4.1	9.2	7.8	.....	9—9 10—9
367*a*	26.2	8.5	46.3	43.7	31.2	23.4§	17.8	8.5	47.2	8.3	19.1	11.7	1.4	9—9 8—9
368*a*	11.2	4.1	21.1	.....	18.8	19.2§	.....	6.1	26.1	3.8	9.4	7.5	0.28	9—9 9—9

* Brooke's collection. † On line with anterior margin of nares. ‡ Least.
§ Between walls of the fossæ.

SYNOPSIS OF THE SPECIES OF DOLPHINS.

1. ARTIFICIAL KEY TO THE GENERA, BASED ON EXTERNAL CHARACTERS.

Head with a beak which is usually distinctly marked off from the forehead by a constriction.

Dorsal fin absent ..... 6. *Tursio.*

Dorsal fin present; triangular or ovate.

Beak not distinctly marked off from the forehead. ..... 10. *Cephalorhynchus.*

Dorsal fin present; falcate.

Beak distinct, short and rim-like ..... { 7. *Lagenorhynchus.* †8. *Sagmatias.** †9. *Feresa.** }

Beak distinct, elongated.

Symphysis of mandible long.

Crowns of teeth rugose ..... 2. *Steno.*

Crowns of teeth smooth ..... 1. *Sotalia* sps.

Symphysis of mandible short.

Sides without longitudinal bands of color ..... { 3. *Tursiops.* 1. *Sotalia* sps. 5. *Prodelphinus* sps. }

Sides with longitudinal bands of color ..... { 4. *Delphinus.* 5. *Prodelphinus* sps. }

Head without a beak, or with merely an obtuse ridge margining the upper jaw.

Crowns of teeth compressed, spade-shaped.

Dorsal fin absent ..... 11. *Neomeris.*

Dorsal fin present, triangular or slightly falcate ..... 12. *Phocæna.*

Teeth conical, nearly or quite upright in the jaws.

Teeth in upper jaw deciduous; mandibular teeth few, confined to the region of the symphysis ..... 14. *Grampus.*

Teeth persistent in both jaws.

Pectoral fins very long and narrow; teeth confined to the anterior half of the rostrum ..... 15. *Globicephalus.*

Pectoral fins broad, ovate; dorsal fin very high and prominent (especially in the male), size large ..... 17. *Orca.*

Pectoral fins moderate, falcate.

Teeth few and large; color black; size large. Pelagic ..... 16. *Pseudorca.*

Teeth small; color bluish-gray. Fluviatile ..... 13. *Orcella.*

Teeth irregular and implanted obliquely in the jaws.

Pectoral fins broad, dorsal fin rudimentary; color white ... 18. *Delphinapterus.*

Teeth wanting (*i. e.*, tusks concealed in the female), or present in the form of a single, very long, straight, spirally grooved tusk (*i. e.*, right tusk concealed in male; rarely both right and left developed). 19. *Monodon.*

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*Known only from skulls.

2. ARTIFICIAL KEY TO THE GENERA, BASED ON CRANIAL CHARACTERS.

Pterygoid bones not extending backward across the optic canal to articulate with the squamosal.

Maxillary teeth deciduous, absent in adult skulls. Mandibular teeth few, confined to the region of the symphysis. Triangular area in front of the superior nares convex ..... 14. *Grampus.*

Maxillary and mandibular teeth both present.

Teeth with compressed, spade-shaped crowns.

Rostrum one-third the total length of the skull ..... 11. *Neomeris.*

Rostrum exceeding one-third the total length of the skull ..... 12. *Phocæna.*

Teeth conical, rugose.

Mandibular symphysis long; rostrum very long and narrow. Pterygoid bones in contact ..... 2. *Steno.*

Teeth conical, smooth.

Palate with two distinct lateral grooves ..... 4. *Delphinus.*

Palate without lateral grooves.

Rostral portion of intermaxillæ convex.

Pterygoid bones separate ..... 1. *Sotalia.*

Pterygoid bones in contact.

Teeth small and numerous (37 to 52) ..... 5. *Prodelphinus.*

Teeth larger (22 to 26) ..... 3. *Tursiops.*

Rostral portion of intermaxillæ flat.

Triangular area in front of superior nares raised, forming a prominent table ..... 8. *Sagmatias.*

Triangular area in front of superior nares not raised above the plane of the surrounding surfaces.

Maxillæ not thickened about the maxillary notch.

Outer border of the proximal end of the intermaxillæ overhanging the adjacent surface of the maxillæ ..... 6. *Tursio.*

Outer border of the proximal end of the intermaxillæ continuous with the adjacent border of the maxillæ ..... 10. *Cephalorhynchus.*

Maxillæ thickened about the maxillary notches.

Teeth small and numerous ..... 7. *Lagenorhynchus.*

Teeth few, confined to the anterior half or anterior two-thirds of the rostrum. Pterygoid bones in contact.

Intermaxillæ greatly expanded on the rostrum, covering the greater part of the maxillæ. Teeth confined to the anterior half of the rostrum ..... 15. *Globicephalus.*

Intermaxillæ moderate. Teeth in the anterior two-thirds of the rostrum ..... 9. *Feresa.*

Teeth few, small, occupying nearly the whole length of the rostrum. Pterygoid bones widely separated ..... 13. *Orcella.*

Teeth few and large; roots cylindrical. Pterygoid bones in contact. Intermaxillæ of equal breadth throughout ..... 16. *Pseudorca.*

Teeth few and large with compressed roots. Pterygoid bones approximated but not touching. Intermaxillæ expanded proximally. 17. *Orca.*

Pterygoid bones extending backward across the optic canal and articulating with the squamosal. Expanded proximal end of the maxillæ in the same plane with the distal portion.

Teeth present, irregular, obliquely implanted in the jaws. No tusks. 18. *Delphinapterus.*

Teeth only in the form of two straight tusks, concealed in the female. The left (occasionally the right also) greatly developed in the male and spirally grooved ..... 19. *Monodon.*

SUBFAMILY I. DELPHININÆ.

1. SOTALIA Gray.

Rostrum long, narrow, and compressed. Symphysis of mandible long or moderate. Pterygoid bones separate, narrow, and divergent posteriorly. Postorbital process of frontal narrow. Teeth moderate, smooth, 26 to 35. Vertebræ 51 to 55.

Head prolonged into a distinct beak. Dorsal fin falcate. Pectoral fins broad at the base, falcate (oval in *S. fluviatilis*), moderate.

Color white or gray, sometimes spotted; no bands of dark color.

SOTALIA SINENSIS Flower.

(Plate 1, fig. 3.*)

"Milky white, with pinkish fins and black eyes" (Swinhoe.)

Teeth $\frac{32}{32}$. Vertebræ: C. 7; D. 12; L. 10; Ca. 22=51.

Temporal fossæ large, rounded. Rostrum rather broad at the base, long, tapering. Palato-pterygoid region constricted. Inner margins of pterygoids separated, parallel proximally, divergent distally. Crowns of teeth smooth, conical, and incurved.

Measurements of the skull.—Total length, 20.7 inches (52.6^{cm}); length of beak, 12.8 inches (32.5^{cm}); breadth of beak at base, 4.7 inches (11.9^{cm}); breadth of same at its middle, 1.85 inches (4.7^{cm}); length of upper tooth-row, 11.2 inches (28.4^{cm}); greatest breadth at postorbital processes of frontal, 8.8 inches (22.4^{cm}).

Habitat.—Quemoy Island, harbor of Amoy, China. ? Foo-chow River (*Swinhoe*). Canton River (*Osbeck*).

SOTALIA PLUMBEA (Cuvier).

(Plate 1, figs. 1 and 2.)

Snout very long; distance from the tip of the snout to the eye one-sixth the total length; dorsal commencing at the end of the first third

* The plates accompanying this synopsis contain, for the most part, reproductions of the best figures of the different species to be found in the literature. For the figures of skulls I have drawn largely upon the admirable illustrations in the atlas of Van Beneden and Gervais' *Ostéographie des Cétacés*, and in Gray's *Synopsis of Whales and Dolphins*. Most of the figures of species described by American authors, however, are new, and have been drawn from specimens in the National Museum.

In the diagnoses I have attempted to give the mean number of teeth (on one side of each jaw) for those species of which numerous skulls are to be found in the museums, but in giving the number of vertebræ I have in some cases indicated the extremes of variation as far as known.

of the length; long and but little elevated; caudal ridges prominent. Breadth of flukes equal to one-fourth the total length.

Color uniform plumbeous gray, except on the extremity and under side of the lower jaw, where it is white.

Teeth $\frac{17}{17}$. Rostrum of skull exceeding three-fifths the total length of the skull, very narrow and obtusely pointed; its breadth at the middle one-sixth its length. Vomer not visible on the palate. Temporal fossæ large and rounded, their length about equal to the breadth of the rostrum at its base. Symphysis of the mandible about one-third the length of the mandible.

Measurements of the exterior (Pucheran).—Total length, 92.9 inches (236^{cm}); tip of snout to dorsal fin, 33.7 inches (85.5^{cm}); to pectoral fin, 22.8 inches (58^{cm}); to eye, 14.9 inches (37.8^{cm}); length of anterior margin of dorsal fin, 16.7 inches (42.5^{cm}); its vertical height, 5.9 inches (15^{cm}); length of anterior margin of pectoral fin, 13.8 inches (35^{cm}); breadth of flukes, 21.7 inches (55^{cm}).

Measurements of the skull.—Total length, 55.9^{cm}; length of beak, 34.9^{cm}; breadth of beak at base, 11.3^{cm}; at its middle, 4.3^{cm}; breadth between orbits, 19.2^{cm}; length of temporal fossa, 11.2^{cm}.

Habitat.—Indian Ocean. Malabar coast, India (*Dussumier*).

SOTALIA GADAMU (Owen).

(Plate 2, figs. 1 and 2.)

Body fusiform, gaining its greatest diameter at the fore part of the dorsal fin. Forehead convex. Snout long and compressed. Pectoral and dorsal fins falcate and of about equal size; the former commence at the beginning of the second fourth of the total length of the body.

Color of body "dark plumbeous grey, almost black upon the fins, especially at their fore part, becoming very gradually lighter to the longitudinal parallel of the attachment of the pectorals, below which the body, from beneath the base of the snout and eye to below the base of the tail, is of a pinkish ashy-grey tint, with a few small irregular blotches of light plumbeous grey" (Owen).

Teeth $\frac{26}{26}$. Rostrum of skull less than three-fifths the length of the skull, depressed, and obtusely rounded off in front; its breadth at the middle about one-fifth its length. Vomer visible in the center of the palate. Pterygoids narrow, curved outwards, and sharply keeled. Length of the temporal fossæ only a little less than the breadth of the beak at its base. Length of the symphysis of the mandible somewhat less than one-third the total length of the mandible.

Measurements of the exterior.—♀ adult (Owen): Total length, 82 inches (209.1^{cm}); tip of snout to dorsal fin, 36 inches (91.8^{cm}); length of pectoral fin (along anterior margin), 18 inches (45.9^{cm}); length of base of dorsal fin, 13 inches (33.2^{cm}); breadth of flukes, 22 inches (56.1^{cm}).

Measurements of the skull.—(82, 1, 2, 3, British Museum): Total length,

43.2cm; length of rostrum, 25.3cm; breadth of beak at base, 9.3cm; breadth of same at its middle, 5cm; breadth between orbits, 17.2cm; length of temporal fossa, 8.8cm.

Habitat.—Indian Ocean. Vizagapatam (*Owen*); Karachi; Australia (*Flower*).

SOTALIA LENTIGINOSA (Owen).

(Plate 2, fig. 3.)

General form as in *S. gadamu*, but with smaller pectoral and dorsal fins, and broader flukes. Caudal ridges prominent.

The color is pretty uniformly bluish cinereous, or slaty, freckled with irregular small spots or streaks of brown or plumbeous pigment, the streaks longitudinal and flecked with white; the under surface is a shade lighter than the rest of the body. (Owen.)

Teeth $\frac{33}{34}$. Skull narrower than in *S. gadamu*. Occipital condyles and temporal fossæ larger. Breadth of the rostrum at the middle one-sixth its length.

Measurements of the exterior.— ♀ adult (Owen): Total length, 94 inches (239.7cm); length of snout, 6 inches (15.3cm); length of mouth, 12 inches (30.6cm); tip of snout to base of pectoral fin, 24 inches (61.2cm); length of pectoral (along anterior curve), 12 inches (30.6cm); tip of snout to dorsal fin, 40 inches (102cm); breadth of flukes, 21 inches (53.6cm).

Measurements of the skull.—(1476*a*, British Museum. Type): Total length, 47cm; length of beak, 28.2cm; breadth of beak at base, 10.2cm; at its middle, 4.7cm; breadth between orbits, 17.4cm; length of temporal fossa, 10.2cm.

Habitat.—Vizagapatam, India (*Owen*).

SOTALIA GUIANENSIS (Van Beneden).

See Van Beneden, Mém. Couron. Acad. Roy. Belgique, coll. in 8°, XVI, 1864, Art. 2.

Also page 17.

Habitat.—Cayenne, French Guiana.

SOTALIA BRASILIENSIS Van Beneden.

(Plate 3, figs. 1 and 2.)

See page 17.

Habitat.—Bay of Rio de Janeiro.

SOTALIA TUCUXI (Gray).

(Plate 5, fig. 2.)

See page 17.

Habitat.—Amazon River; mouth of Tocantins River (*Bates*); ? Florida (*U. S. National Museum*).

SOTALIA PALLIDA (Gervais).

(Plate 4, figs. 1 and 2.)

General form similar to that of *S. fluviatilis*. Beak rather longer and less distinctly marked off from the forehead. Lower jaw extending beyond the upper. Dorsal fin less elevated than in the *S. fluviatilis*, triangular, strongly emarginated behind. Pectoral fins smaller than in *S. fluviatilis*; less pointed and more constricted at the base.

Upper surface of the body, head, dorsal and caudal fins yellowish white. Under surface of body, lower jaw, and pectoral fins, white. (d'Orbigny and Gervais.)

Teeth $\frac{30}{31}$, small and pointed. Temporal fossæ large and square.

Measurements of the exterior.—Total length, 165^{cm}; greatest girth, 98^{cm}.

Measurements of the skull.—Total length, 34^{cm}.

Habitat.—Upper Amazon River; Nauta, Peru (*Gervais*); ? mouth of Rio Negro (*Natterer*).

SOTALIA FLUVIATILIS (Gervais).

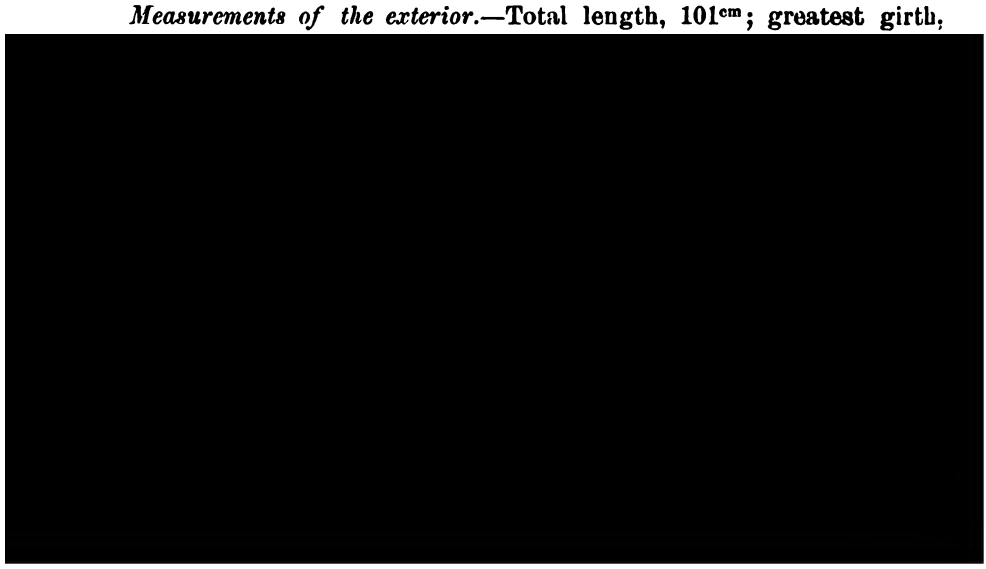
(Plate 5, fig. 1.)

Head swollen; beak distinct, moderately prolonged. Pectoral fins large, oval in outline and pointed. Dorsal fin falcate, a third longer than high.

Upper parts of the body gray, approaching black; lower jaw and under surface of the body roseate-lilac. The color of the upper parts is extended through the eye in the form of a broad blackish band reaching the pectoral fins, which are likewise blackish. Immediately behind this band the light color of the lower surfaces rises higher than elsewhere on the sides. (d'Orbigny and Gervais).

Teeth, $\frac{28}{28}$.

Measurements of the exterior.—Total length, 101^{cm}; greatest girth,



STENO ROSTRATUS (Desmarest).

(Plate 6, figs. 1 and 2.)

Snout long, separated from the low forehead by a distinct constriction. Dorsal and pectoral fins falcate.

Color of the upper surfaces and fins purplish sooty black; sides marked with rather large stellate yellowish-white spots. Snout and under surfaces of the body white, more or less tinged with purple and rose-color, and marked with prominent purple spots. (Lütken.)

Vetebræ: C. 7; D. 13; L. 15; Ca. 30 = 65.

Teeth, $\frac{20}{20}$ to $\frac{25}{27}$; rugose. Skull massive. Rostrum long and compressed, its breadth at the middle 11.5 per cent. to 18.8 per cent. of its length. Frontal plates of the maxillæ strongly bent; intermaxillæ convex, at wide opening between them opposite the maxillary notch. Temporal fossæ very large and rounded; pterygoid bones meeting in the median line; vomer extending to the middle of the palate and visible in the median line; mandible growing gradually attenuated from behind forwards, not keeled at the symphysis. Symphysis very long.

Measurements of the skull.—(British Museum No. 346*a*. Type of *S. compressus*): Total length, 51.1^{cm}; length of rostrum, 32.5^{cm}; breadth of rostrum at its base, 9.3^{cm}; at its middle, 4.2^{cm}; breadth of intermaxillæ at same point, 2.9^{cm}; breadth between orbits, 16.4^{cm}; length of temporal fossa, 8.6^{cm}. (British Museum No. 345*c*. Type of *S. frontatus*): Total length, 51.1^{cm}; length of rostrum, 30^{cm}; breadth of rostrum at its base, 10.7^{cm}; at the middle, 5.2^{cm}; breadth of intermaxillæ at same point, 3.6^{cm}; breadth across orbits, 19 3^{cm}; length of temporal fossa, 10.7^{cm}. (For measurements of the exterior see page 28.)

Habitat.—Indian Ocean. Java. Atlantic Ocean; 1° 14′ S. lat., 17° 20′ W. long. (*Lütken.*)

STENO PERSPICILLATUS Peters.

(Plate 7, figs. 1 and 2.)

Form generally like *Tursiops tursio*. Beak distinctly separated off from the forehead. Dorsal and pectoral fins falcate.

Back black, belly white, sides of body and head yellowish white. A milk-white stripe from the pectoral fin to the eye. Eye surrounded by a brown ring, from which a narrow brownish-black line goes forward along the base of the forehead to meet its fellow on the opposite side of the head. A similar line from the corner of the mouth to the base of the pectoral fin. (Peters.)

Teeth, $\frac{23}{24}$; rugose. Vertebræ: C. 7; D. 12; L. 15; Ca. 32 = 66. Skull like that of *S. rostratus*. (See p. 25.)

Measurements of the exterior (From Peters).—Total length, 92.8 inches (185^{cm}); extremity of snout to dorsal fin, 32.3 inches (82^{cm}); to pectoral

fin, 17.3 inches (44^{cm}); length of base of dorsal fin, 7.9 inches (20^{cm}); height of dorsal fin, 6.3 inches (16^{cm}); length of pectoral fin, 11 inches (28^{cm}).

Measurements of the skull.—(Berlin Museum. Type, ♀): Total length, 49.9^{cm}; length of rostrum, 29.3^{cm}; breadth of rostrum at its base, 11.1^{cm}; at its middle, 5.8^{cm}; breadth of intermaxillæ at same point, 3.7^{cm}; breadth between orbits, 20.4^{cm}; length of temporal fossa, 11^{cm}.

Habitat.—South Atlantic Ocean, 32° 29′ 7″ S. lat., 2° 1′ W. long. (*Peters.*)

3. TURSIOPS Gervais.

Rostrum moderately long, tapering; pterygoid bones normal, in contact; symphysis of mandible short; postorbital process of frontal triangular; teeth large, smooth, 22–26; vertebræ, 61 to 64.

Beak moderate, tapering, distinctly marked off from the forehead; dorsal and pectoral fins falcate; color gray or greenish, lighter below, sometimes with spots.

TURSIOPS TURSIO (Fabricius).

(Plate 8, figs. 1 and 2.)

General form stout. Forehead sloping; beak short and depressed; lower jaw usually longer than the upper jaw. Dorsal fin situated in the middle of the length, high and falcate. Pectoral fins broad at the base, obtusely rounded off at the tip, and not deeply emarginate behind.

Back, dorsal, pectoral, and caudal fins, snout, and sometimes the tip of the lower jaw and lower lip, clear, plumbeous gray, more or less tinged with purple. The gray color becomes lighter on the sides, and passes by insensible gradations into the pure white of the under surfaces. In some individuals all that portion of the body lying back of the anus is gray; in others the body is bicolor as far as the flukes. (Specimens have occasionally been captured which were entirely of a gray color.)

Teeth, $\frac{22}{22}$. Vertebræ: C. 7; D. 13; L. 17; Ca. 27=64. Skull massive. Rostrum rather broad, depressed; its length slightly exceeding one-half the total length of the skull. Intermaxillæ thick and swollen. Vomer appearing in the center of the palate. Pterygoid bones broad and obtusely keeled. Inferior surface of frontal not deeply concave in front of the optic canal. Temporal fossæ large and elliptical in outline. Inferior extremity of the parietal broad. Greatest diameter of the condyle of the mandible contained two and a half times in the greatest depth of the ramus. Teeth large. Second finger longer than the third.

Measurements of the exterior.—♂ adult. (Flower.) Total length, 114 inches (290.7^{cm}); length of mouth, 12.5 inches (31.9^{cm}); tip of snout to dorsal fin, 50 inches (127.5^{cm}); length of pectoral fin, 15.5 inches (39.5^{cm});

vertical height of dorsal fin, 9 inches (22.9^{cm}); breadth of flukes, 24 inches (61.2^{cm}).

Measurements of the skull.—(British Museum, 353*g*): Total length, 57.8^{cm}; length of rostrum, 32^{cm}; breadth of rostrum at base, 15.8^{cm}; at its middle, 9.7^{cm}; breadth between orbits, 28^{cm}; length of temporal fossa, 13.2^{cm}.

Habitat.—Coast of Europe: North Sea to Bay of Biscay; Mediterranean; Gulf of Lyons. Atlantic coast of North America:* Maine to Florida. Gulf of Mexico: Texas. Uruguay: Uruguay River (*Burmeister*). New Zealand: Dusky Bay (*Hector*); Seychelle Islands (*Flower*). The last three perhaps not this species.

TURSIOPS PARVIMANUS Lütken.

Smaller than *T. tursio*. Head, back, and fins blackish; belly grayish white.

Teeth, $\frac{25}{24}$. Vertebræ, 62. Ribs, 13 pairs. Pectoral fins small, about one-eighth the total length. Third finger longer than the second. (Lütken.)

Habitat.—Adriatic Sea.

TURSIOPS CATALANIA (Gray).

Upper surfaces lead-color, passing gradually on the sides into the white of the lower surfaces; sides, lower surfaces, and pectoral fins covered with longitudinally elongated blotches of dark lead-color. (Gray.)

Teeth, $\frac{25}{25}$. Skull like that of *T. tursio*, but smaller; the rostrum longer [about three-fifths the total length] and narrower.

Measurements of the exterior.— ♀ (Gray). Total length, 81 inches (206.55^{cm}); tip of snout to dorsal fin, 36 inches (91.8^{cm}); length of anterior border of dorsal fin, 13 inches (33.2^{cm}); height of dorsal fin, 8 inches (20.4^{cm}); length of pectoral fin, 13 inches (33.2^{cm}); breadth of flukes, 22 inches (56.1^{cm}).

Measurements of skull.—(Same individual—British Museum 1391*b*). Total length, 41.5^{cm}; length of rostrum, 23.8; breadth of rostrum at base, 10.4^{cm}; at its middle, 6.1^{cm}; breadth between orbits, 19^{cm}; length of temporal fossa 9.4^{cm}.

Habitat.—Northeast coast of Australia.

TURSIOPS ABUSALAM (Rüppell).

(Plate 9, figs. 1 and 2.)

Smaller than *T. tursiops*, which it resembles in general form.

Upper surface of the head and body, the tail and fins, dark sea-green. Margin of the upper lip, and entire under surface of the body to the anus whitish flesh-color; belly with small, irregularly distributed dark green spots. Iris dark green. (Rüppell.)

* The commonest species.

Teeth $\frac{26}{26}$. Vertebræ, C. 7; D. 12; L. 16; Ca. 26=61. Skull as in *T. catalania*, but narrower across the orbits and with the beak narrower at its base.

Measurements of the exterior (from Rüppell).— ♀ adult. Total length, 76.4 inches (194.9^{cm}); tip of snout to eye, 11.6 inches (29.7^{cm}); to dorsal fin, 35 inches (89.3^{cm}); vertical height of dorsal fin, 8.5 inches (21.6^{cm}); breadth of flukes, 20.2 inches (51.4^{cm}).

Measurements of the skull.—(Type.) Total length, 46^{cm}; length of rostrum, 27^{cm}; breadth of rostrum at its base, 9.2^{cm}; breadth of intermaxillæ at same point, 3.4^{cm}; breadth between orbits, 18.7^{cm}.

Habitat.—Red Sea.

TURSIOPS GILLII Dall.

(Plate 10, figs. 1 and 2.)

Exterior known only from an outline drawing and record of two "momentary observations" by Scammon.

In general form similar to *T. tursio*. Color "black all over, lightened a little below."

Teeth $\frac{22}{22}$. Skull like that of *T. tursio* in form and size. Condyles of the mandible large, their greatest diameter contained twice in the greatest depth of the ramus. Optic canal not rising to the level of the inferior surface of the frontal bone, which is deeply concave in front of it. Lower end of visible portion of parietal a narrowish band, between the squamosal and a backward prolongation of the frontal.

Measurements of the skull.—Total length, 54^{cm}; length of rostrum, 29.8^{cm}; breadth of rostrum at its base, 14.1^{cm}; at its middle, 8.8^{cm}; breadth between orbits, 24.5^{cm}; length of temporal fossa, 13.5^{cm}.

Habitat.—North Pacific Ocean: Monterey, Cal., and Lower California. (*U. S. National Museum.*)

4. DELPHINUS Linné.

Palate with two deep lateral grooves. Rostrum long and narrow. Pterygoid bones normal, in contact. Symphysis of mandible short. Teeth small, acutely pointed, and numerous, 47 to 65. Vertebræ, 73 to 76.

Head with a distinct long beak. Dorsal and pectoral fins falcate, moderate. Color black above, lighter below, with several conspicuous longitudinal bands.

DELPHINUS DELPHIS Linné.

(Plate 11, figs. 1, 2, and 3.)

Body slender; forehead sloping gradually, forming a wide angle with the beak; beak long and slender (average about one fourteenth the total length); dorsal fin in the middle of the median dorsal line, narrow, and not strongly recurved above, its vertical height about one-ninth

the total length; pectoral fins about three times as long as broad, narrow in the distal half, and obtusely pointed.

Form and disposition of color-markings very variable. Back, upper jaw, tail, and fins black or dark gray; under parts white or greenish-white. The black area extends down upon the sides under the dorsal fin in the form of an angular projection (sometimes indistinct), the apex of which is met by the apex of a similar upward projection of the white of the under parts. Sides occupied by two elongated elliptical areas of light color, the anterior and larger of which is fulvous in some individuals and gray in others; the posterior area is gray. A black, gray, or greenish band extends from the lower jaw to the base of the pectoral fin (sometimes absent). Eye surrounded by a ring of black, from which a narrow black band extends forward to the base of the beak. End and margin of lower jaw usually black. One or two longitudinal bands of gray or greenish-gray traverse the light color of the lower part of the sides.

Teeth $\frac{47}{46}$ to $\frac{50}{51}$. Vertebræ: C. 7; D. 14(–15); L. 21(–22); Ca. 30 (–32)=73(–76). Rostrum depressed and elongated, its length exceeding one-half the total length (58 per cent. to 64 per cent.). Premaxillæ convex, anchylosed together in the median line. Proximal fifth of the palatal ridge with nearly parallel margins, its sides excavated by the lateral grooves. Pterygoid bones sharply keeled. Vomer appearing in the median line of the palate as a linear slip. Temporal fossæ elongated, their length a little more than one-sixth the total length of the skull.

Measurements of the exterior.—♂ (21524 U. S. National Museum. Wood's Holl, Mass.). Total length, 89 inches (226.1^{cm}); end of beak to dorsal fin, 39.3 inches (99.8^{cm}); to pectoral fin, 20.0 inches (50.8^{cm}); vertical height of dorsal fin, 9.0 inches (22.9^{cm}); length of pectoral fin, 14 inches (35.6^{cm}); breadth of flukes, 20.5 inches (52.1^{cm}).

Measurements of the skull.—(20873 U. S. National Museum. Block Island, R. I. See p. 48.) Total length, 46.7^{cm}; length of rostrum, 28.2^{cm}; breadth of rostrum at its base, 9.3^{cm}; at its middle, 5.3^{cm}; breadth between orbits, 17.1^{cm}; length of temporal fossa, 7.2^{cm}.

Habitat.—Pelagic.

DELPHINUS LONGIROSTRIS Cuvier.

(Plate 12, fig. 2.)

External characters unknown.

Teeth $\frac{65}{58}$. Rostrum of skull greatly elongated (67.9 per cent. of the total length); its breadth at the maxillary notches one-fourth its length. Length of the symphysis of the mandible one-fifth the length of the skull. Temporal fossæ large and rounded. Palatal grooves and ridge as in *D. delphis*.

Measurements of the skull.—(Type.) Total length, 49.5^{cm}; length of

rostrum, 33.7cm; breadth of rostrum at base, 8.4cm; at its middle, 3.8cm; breadth between orbits, 14.7cm; length of temporal fossa, 7.4cm.

Habitat.—Malabar coast, India.

DELPHINUS CAPENSIS Gray.

(Plate 12, fig. 1.)

See page 58.

DELPHINUS ROSEIVENTRIS Wagner.

(Plate 13, figs. 1 and 2.)

(Description from Hombron and Jacquinot's figure and Jacquinot and Pucheran's description.)

Size small. Form stout. Forehead rather abruptly sloping; beak long (one-eleventh the total length). Dorsal fin large, broad, and not strongly recurved above; its vertical height above one-ninth the total length. Pectoral fin narrow, and not deeply emarginate posteriorly; its length equal to that of the mouth.

Back, tail, and fins, beak and margin of lower jaw black or dark gray; under parts pale rose-color; lower half of side white tinged with yellowish. A circle of black surrounds the eye, from which a band extends forward to meet its fellow of the opposite side. A broad pale-gray band from the base of the pectoral fin to the eye.

Teeth $\frac{48}{48}$. Skull similar to that of *D. longirostris*, but much smaller. Length of rostrum about 65 per cent. of the total length. Intermaxillæ high and convex. Lateral grooves of the palate shallow, disappearing near the distal end. Vomer occupying about one-third of the median line of the palate. Temporal fossæ large and depressed.

Measurements of the exterior (from Jacquinot and Pucheran).—Total length, 46.5 inches (118cm); tip of beak to eye, 8.7 inches (22cm); to base of dorsal fin, 19.9 inches (50.5cm); to base of pectoral fin, 12.2 inches

Head with a distinct elongated beak. Dorsal and pectoral fins falcate (?the former triangular in *P. frænatus*). Color black or gray above, light below, with spots or longitudinal bands.

PRODELPHINUS CÆRULEO-ALBUS (Meyen).

(Plate 14, figs. 1 and 2.)

Head rounded and much arched. Snout very flat, longer than in *D. delphis* and less compressed; lower jaw protruding a little beyond the upper jaw. Pectoral and dorsal fins pointed and not deeply emarginate behind.

Teeth $\frac{50}{50}$, conical, pointed, and curved inward. Vertebræ: C. 7; D. 14; L. and Ca. 52+. Skull similar to that of *P. euphrosyne*, but with small temporal fossæ, which are directed upward.

Back and forehead dark steel blue. A very dark blue stripe starts from the dorsal fin, and, passing forward, ends abruptly in front. A narrow blue stripe on the sides from the eye to the vent, expanded at the posterior end. Pectoral fin blue-gray, connected by a colored band with the ring which surrounds the eye. Belly, snout, and other parts of the body white. (Meyen.)

Habitat.—Coast of South America, near the mouth of the Rio de la Plata.

PRODELPHINUS EUPHROSYNE (Gray).

(Plate 15, figs. 1 and 2.)

Body robust; snout long; dorsal fin high and falcate; pectoral fins small.

Upper parts black; sides blackish; margins of the jaws blackish, their extremity entirely black; throat and belly white; circumference of the eye black. A narrow black band (broadest at the extremities) from the eye to the vent, with a branch given off above the base of the pectoral fins and running a short distance downwards and backward. A band of white, broadest in the middle, separates the lateral black band from the dark color of the sides above; another and broader black band extends from the eye to the base of the pectoral fin and has along its center a white area which communicates with the white of the throat immediately below the eye. Fins black, with a narrow line of white on their anterior margin (sometimes absent).

Teeth $\frac{45}{44}$. Vertebræ: C. 7; D. 15; L. 22; Ca. 32 = 76.

Measurements of the exterior.—Total length (on the curves), 209.7^{cm}; tip of beak to the anterior base of the dorsal fin, 93.2^{cm}; breadth of flukes, 42^{cm}; length of anterior margin of pectoral fin, 30.5^{cm}. (Pucheran: *D. marginatus.*)

Measurements of the skull.—(*Mus. d'Hist. nat.* Type of *D. margina-*

[illegible] length 47.3cm; length of beak, 29.2cm; breadth of same [illegible]

[illegible] Ocean; South Greenland (*Brown*); Shetland and [illegible]; Dieppe; mouth of Orb River; ? Mediterranean [illegible]; Jamaica (*Royal Victoria Hosp., Netley*); between [illegible] Islands (*Lütken*); South Africa (*Flower*).

PRODELPHINUS (?) LATERALIS (Peale).

(Plate 15, fig. 3.)

[illegible] black; snout small; body much compressed behind the dorsal [illegible] light purplish-gray; beneath white. A dark lateral line, [illegible] spots, separates the colors of the upper and under parts of [illegible]. A separate line, paler in color, branches from the lateral line [illegible] the pectoral fins and passes downwards and backward; another [illegible] the eyes and pectoral fins; snout black; fins black. (Peale.)

[illegible] length, 7 feet 6 inches.

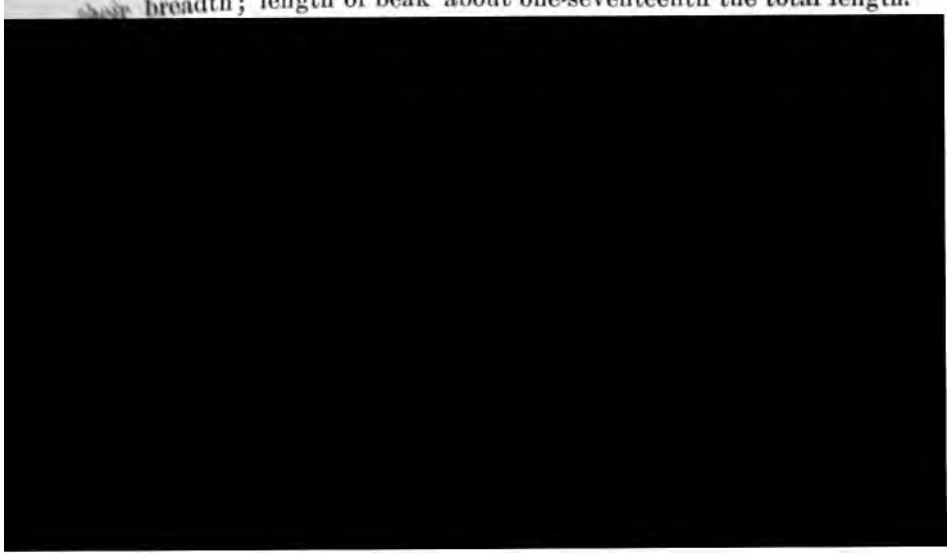
[illegible] (Cranial characters unknown.)

[illegible]—Pacific Ocean, lat., 13° 53′ N.; long., 161° 22′ W.

PRODELPHINUS (?) PLAGIODON (Cope).

(Plate 18, figs. 1 and 2.)

[illegible] form like that of *Delphinus delphis*. Dorsal fin high and [illegible]ly recurved; a line joining the center of its base and its extrem- [illegible] makes an angle of 45 degrees with the longitudinal axis of the body; [illegible] margin straight in the lower three-fourth, then rather strongly [illegible] backward; the concavity of the posterior margin forms an arc [illegible] circle. Pectoral fins broad at the base. Beak stout; the depth [illegible] jaws taken together, at the middle, about one-third greater than [illegible] breadth; length of beak about one-seventeenth the total length.



Measurements of the skull.—Total length, 45.9^{cm}; length of rostrum, 27.4^{cm}; breadth of rostrum at its base, 10.9^{cm}; at its middle, 5.8^{cm}; breadth, between orbits, 18.6^{cm}; length of temporal fossa, 8.4^{cm}.

Habitat.—Atlantic coast of United States; Cape Hatteras; Gulf of Mexico (*U. S. National Museum*).

PRODELPHINUS MALAYANUS (Lesson).

(Plate 16, figs. 1 and 2.)

Blowhole placed a little behind the line of the eyes, which are very small. Head large and rounded, very convex on the forehead, which slopes rapidly. A deep furrow at the base of the beak, which is narrow and elongated; lower jaw the longer. (Lesson.)*

Color, uniform ashy.

Skull.—(From Celebes. Identified with this species by Schlegel.) Teeth $\frac{39}{39}$. Skull like that of the type of *P. attenuatus* (Gray), but absolutely larger, with relatively longer beak and shorter tooth-row.

Measurements of the exterior.—(From Lesson.) Total length, 192.2^{cm}; height of dorsal fin, 21.6^{cm}; length of pectoral fin, 35.1^{cm}.

Measurements of the skull.—(Mus. Pays-Bas, No. 5. Identified with this species by Schlegel.) Total length, 42.5^{cm}; length of rostrum, 26.7^{cm}; breadth of rostrum at base, 9.2^{cm}; at its middle, 4.4^{cm}; breadth of intermaxillæ at same point, 2.1^{cm}; length of temporal fossa, 6.9^{cm}; depth of temporal fossa, 5.2^{cm}.

Habitat.—East Indies.

PRODELPHINUS ATTENUATUS (Gray).

(Plate 17, figs. 1 and 2.)

Color dark on the back, ashy-gray below. (Lütken).

Teeth, $\frac{35}{37}$ to $\frac{44}{43}$. Skull (*D. attenuatus*, Gray, type) closely resembles that of *P. malayanus*. Vertebræ: C. 7; D. 15; L. 21; Ca. 36–38= 79–81. (Lütken.)

Measurements of the exterior, ♀. (Lütken.) Total length, 69.1 inches (175.5^{cm}); length from extremity of snout to dorsal, 32.2 inches (81.9^{cm}); length from extremity of snout to pectoral, 15.9 inches (40.3^{cm}); length of snout, 4.6 inches (11.7^{cm}).

Measurements of the skull.—(347*b*. British Museum. Type of *P. attenuatus*.) Total length, 38.3^{cm}; length of rostrum, 22.9^{cm}; breadth of rostrum at base, 8.7^{cm}; at its middle, 3.8^{cm}; breadth between orbits, 14.7^{cm}; length of mandible, 32.9^{cm}.

Habitat.—Atlantic Ocean, near St. Paul Island (*Lütken*). Cape of Good Hope (*Gray*).

*One of the characters given by Lesson is as follows: "A strong carina, as in certain scombroid fishes, occupied the lateral and posterior parts of the body." The meaning of this is not clear.

PRODELPHINUS FRŒNATUS (F. Cuvier).

(Plate 19, figs. 1 and 2; plate 20, fig. 1.)

Smaller than *P. plagiodon*, which it resembles in coloration.

Color of the back and fins dark, sides lighter, belly white; sides marked with dark spots, the smaller of which are stellate. Dorsal and pectoral fins with small spots (Lütken).

1. ♀ Variety. Back dark greenish-gray, sharply separated from the white of the belly. A dark line from the snout to the pectoral fin, below which there are dark streaks and spots on the ground-color (Lütken).

2. ♀ Variety.—General form like that of *P. plagiodon*. "Dorsal fin high, rather acute at the tip. Black, sides with minute white specks; the sides of the body above the base of the pectoral to the base of the tail blackish gray, which color is obliquely extended as a lunate band from behind the vent to the back near the base of the tail." (Gray, *D. punctata*, Catalogue, p. 399.)

3. ♀ Young.—Form stout; dorsal fin triangular, in the middle of the back; pectoral fins long and narrow; flukes very broad.

Back black, which color becomes paler on the sides. Belly white as far as the middle of the tail. Head black above, ashy on the sides; a band of deeper tint extends from the corner of the mouth to beyond the eyes. (F. Cuv., *D. frœnatus*, Hist. nat. des Cétacés, p. 155.)

Teeth, $\frac{38}{37}$. Vertebræ: C. 7; D. 14; L. 16–18; Ca. 31–33=70. Skull like that of *P. plagiodon*, but smaller.

Measurements of the exterior (Lütken), ♂.—Total length, 73.7 inches (187.2^{cm}); extremity of snout to dorsal fin, 33.8 inches (85.8^{cm}); extremity of snout to pectoral fin, 15.4 inches (39^{cm}).

(*D. punctatus*, Gray, Catalogue, p. 299.) ♀. End of snout to tip of tail, 72 inches (182.9^{cm}); to blowhole, 12⅞ inches (32.7^{cm}); to eye, 12⅞ inches (32.7^{cm}); to dorsal fin, 32¼ inches (81.9^{cm}).

(*D. frœnatus* F. Cuv. Hist. nat. des Cétacés, p. 156.) Total length

Vertebræ: C. 7; D. 11; L. 18; Ca. 34=73.

Teeth, $\frac{52}{52}$. Skull small. Rostrum very long (two thirds the total length), depressed and broad (at the middle about one third the breadth at the orbits). Triangular area in front of nares short and only slightly depressed. Temporal fossæ very small and rounded, their length equal to the distance between the ante- and post-orbital processes of the frontal. Zygomatic process of squamosal short. Palate with traces of lateral grooves; vomer visible in the median line.

Measurements of the skull.—(No. 12, Mus. Pays-Bas. Type of *D. longirostris*, Gray.) Total length, 42^{cm}; length of rostrum, 28^{cm}; breadth of rostrum at base, 7.5^{cm}; at its middle, 4.6^{cm}; breadth between orbits, 14^{cm}; length of temporal fossa, 5^{cm}.

Habitat.—Cape of Good Hope (*type*); between Panama and the Galapagos Islands (*U. S. Nat. Mus.*); Australia (*Copenhagen Mus.*).

6. TURSIO Wagler.

Rostrum long, broad, tapering and flat. Rostral portion of intermaxillæ flat. Pterygoid bones separate, the inner margins parallel. Symphysis of mandible short. Teeth small, acute, and numerous, 43 to 44.

Head with a short, but distinct narrow beak (nearly in the same plane with the forehead in *L. peronii*). *No dorsal fin.* Pectoral fins falcate. Caudal ridges prominent. Color black above, white below, with sharply defined borders.

TURSIO PERONII (Lacépède).

(Plate 21, figs. 1 and 2.)

Body thickest about opposite the pectoral fin; from thence it tapers gradually to the flukes and rather abruptly toward the end of the beak. Beak short, and nearly in the same plane with the forehead. Lower jaw slightly longer than the upper. Pectoral fins and flukes shaped like those of *Delphinus delphis*.

Upper part of head, back, and flukes of a uniform black color. Lower half or third of sides, the snout, lower third of forehead and pectoral fins pure white. The two colors meet abruptly on the sides and do not commingle. A broad black spot on the upper posterior margin of the pectoral fins (Bennett); sometimes absent (?).

Teeth, $\frac{43}{43}$. Bones of skull thin and light. Rostrum broad and flat, extremity rounded off; the margins beveled in the distal half. Its length slightly exceeds one-half the total length. Its breadth at the middle exceeds one-fourth its length. Prenareal triangular area long and but slightly concave. Intermaxillæ not touching in the median line; most widely separated distally. Central part of mandibular symphysis raised above the level of the inferior margin of the mandible;

symphysis keeled. Projection of maxilla inclosing the maxillary notch externally rounded off.

Measurements of the exterior (from Lesson).—Total length, 71.8 inches (184.1^{cm}); length from extremity of snout to pectoral fin, 23.2 inches (59.5^{cm}); length of pectoral fin, 12.1 inches (31.1^{cm}); length of mouth, 10.6 inches (27.1^{cm}); breadth of flukes, 16.9 inches (43.3^{cm}).

Measurements of skull.—(3029, R. Coll. Surg. Tasmania.) Total length, 44^{cm}; length of rostrum, 11.2^{cm}; breadth of rostrum at its base, 6.1^{cm}; at its middle, 3.6^{cm}; length of temporal fossa, 6.9^{cm}; breadth between hinder margins of temporal fossæ, 16^{cm}.

Habitat.—Seas about Cape Horn; New Zealand; New Guinea (*Quoy*); Tasmania.

TURSIO BOREALIS (Peale).

(Plate 22, figs. 1 and 2.)

Form slender. Snout short, distinct. Flukes small. Lower jaw longer than the upper and curved upwards at the extremity.

Color black, except in the following regions, where it is white: Extremity of lower jaw; a large lozenge-shaped area between the pectoral fins and a line extending thence to the flukes. Lower side of flukes clouded with white. Eyes dark brown.

Teeth, $\frac{44}{47}$. Skull like that of *L. peronii*, but the mandible more slender and the symphysis of the same not keeled. The projection of the maxilla which bounds the maxillary notch externally pointed. Superorbital plate of maxilla and frontal bone very thin. Rostrum tapering distally to a sharp termination, its breadth at the middle somewhat less than one-fourth its length.

Measurements of the exterior.—(From Mr. Dall's MS. notes.) Total length, 97 inches (246.4^{cm}); distance from extremity of snout to pectoral fin, 25 inches (63.5^{cm}); length of pectoral fin (along anterior margin), 12 inches (30.5^{cm}); breadth of flukes, 16 inches (40.6^{cm}).

Measurements of the skull.—(National Museum, 8160. Cape Mendocino, Cal. ♀.) Total length, 43.7^{cm}; length of rostrum, 24^{cm}; breadth of rostrum at its base, 11^{cm}; at its middle, 5.6^{cm}; breadth between orbits, 17.6^{cm}; length of temporal fossa, 7.1^{cm}.

Habitat.—North Pacific Ocean; California (*Dall*); Japan (*Hilgendorf*).

7. LAGENORHYNCHUS Gray.

Rostrum large and broad. Rostral portion of intermaxillæ flat (somewhat convex in *obliquidens* and *electra*). Pterygoid bones in contact or separate. Symphysis of mandible short. Teeth variable in size, 22–45. Vertebræ, 73 to 92.

Head with a short, plowshare-like beak (not distinctly marked off from the forehead in *obscurus*). Dorsal and pectoral fins moderate, falcate. Caudal ridges very prominent. Sides with two areas of light color separated by irregular, oblique dark bands.

LAGENORHYNCHUS ACUTUS Gray.

(Plate 23, figs. 1 and 2.)

Form stout; greatest girth of the body anterior to the middle of its length. Forehead gradually sloping; beak very short, a mere rim; a depression between it and the forehead on either side of the head; dorsal fin high and recurved, and attenuated in the distal half. Pectoral fins broad at the base, pointed. Flukes large; caudal ridges very strongly developed.

Upper jaw, forehead, back, and fins black; sides of head and body gray. On the upper part of the sides of the tail the gray color passes into dusky yellowish; lower down on the sides, below the dorsal fin, an oblong area of white. A narrow black band extends along the sides from the base of the flukes to about the line of the dorsal fin (? sometimes absent); another line of black extends from the base of the pectoral fins to a point between the eye and the corner of the mouth; the eye is surrounded by a circle of black, from which a line extends forward to the beak; the vent is in a small black area. The base of the flukes inferiorly and the adjacent margin of the tail are whitish. The margin of the lower jaw is sometimes black.

Teeth $\frac{35}{37}$. Vertebræ: C. 7, D. 15, L. 19, Ca. 39=80. Skull broad and massive; rostrum broad, its length one-half the total length of the skull. Proximal expanded portion of the maxillæ broad (breadth across post-orbital processes of frontal equal to length of rostrum). Premaxillæ flat, their outer margin sinuate. Temporal fossæ elongate and extending obliquely upward. Pterygoid bones in contact; large, with lateral keels and obtuse crests, the postero-internal free edge transverse and not strongly emarginate; vomer appearing in the center of the palate as a ridge about 5^{cm} long; it is joined by a linear slip of the intermaxillæ, which extends thence along the distal half of the palate to the extremity of the rostrum, becoming broader distally.

Measurements of the exterior (from Duguid).—Total length (along the back), 99 inches (251.5^{cm}); extremity of snout to pectoral fin, 16 inches (40.6^{cm}); to dorsal fin, 37 inches (93.9^{cm}); vertical depth of dorsal fin, 13 inches (33^{cm}); length of pectoral fins, 13 inches (33^{cm}); breadth of flukes, 25 inches (63.5^{cm}).

Measurements of the skull.—(U. S. National Museum, 14244, Cape Cod). Total length, 42.5^{cm}; length of rostrum, 21.6^{cm}; breadth of rostrum at base, 11.4^{cm}; at its middle, 7.6^{cm}; breadth between orbits, 21.6^{cm}; length of temporal fossa, 8.4^{cm};* depth of temporal fossa, 4.3^{cm}.

Habitat.—North Atlantic Ocean; North Sea; Faroe Islands; Greenland; coast of the United States, Cape Cod.

* Rather large; mean 7.9^{cm}.

LAGENORHYNCHUS FITZROYI (Waterhouse).

(Plate 24, fig. 1.)

Body anteriorly somewhat depressed, posteriorly compressed; head conical, arched above; the lower lip projecting beyond the upper; eye placed above and behind, but near the angle of the mouth; breathing-vent situated in the same line as the eyes, supposing a circle to be taken round the head.

Upper parts of the body black, under parts pure white, the two blended into each other by gray; extremity of snout, a ring around the eye, the edge of the under lip, and the tail-fin black; dorsal and pectoral fins dark gray; a broad gray mark extends from the angle of the mouth to the pectoral fin, above which the white runs through the eye and is blended into gray over the eye; two broad deep gray bands are extended in an oblique manner along each side of the body, running from the back downwards and backwards; iris of eye dark brown.

Teeth $\frac{20}{27}$, slightly curved and conical. (Waterhouse.)

Measurements of the exterior.—Total length (along curve of back), 5 feet 4 inches (162.6^{cm}); tip of muzzle to dorsal fin, 2 feet 6 inches 5 lines (77.3^{cm}); length of mouth, 7 inches 9 lines (19.7^{cm}); height of dorsal fin, 6 inches 4 lines (16.1^{cm}); length of pectoral fin (along anterior margin), 1 foot 2$\frac{3}{4}$ inches (37.3^{cm}); breadth of flukes, 1 foot 4 inches 5 lines (11.2^{cm}).

Habitat.—St. Joseph's Bay, Patagonia, lat. 42° 30′ S.

LAGENORHYNCHUS CRUCIGER (d'Orbigny and Gervais).

(Plate 25, figs. 1 and 2.)

Beak short, only slightly marked off from the convexity of the forehead.

Muzzle to the corner of the mouth, forehead, back, dorsal fin, tail and pectoral fins black. On the sides, from the eye and base of the pec-

Measurements of the skull.—(Mus. d'Hist. Nat., Paris. No. a 3045. Type.) Total length, 34.9^{cm}; length of rostrum, 17.8^{cm}; breadth of rostrum at the base, 10.7^{cm}; at its middle, 6.6^{cm}; breadth of intermaxillæ at same point, 4.1^{cm}; breadth between orbits, 17.1^{cm}; length of temporal fossa, 6.9^{cm}; depth of temporal fossa, 4.1^{cm}.

Habitat.—Seas south of Cape Horn; Pacific Ocean.

LAGENORHYNCHUS SUPERCILIOSUS (Schlegel).

(Plate 25, fig. 3.)

Teeth $\frac{29}{30}$. Vertebræ: C. 7, D. 13, L. 20, Ca. 33=73. Skull similar to that of *L. obliquidens*, but smaller. Pterygoid bones (apparently) in contact in the median line. Intermaxillæ not broad proximally, flat in the rostral portion; outer margins wavy. Length of rostrum exceeding one-half the total length of the skull (54.5 per cent). Temporal fossæ moderate, elliptical, directed obliquely upwards.

In the skeleton the neural arches become obsolete at the sixtieth vertebra; the transverse processes become obsolete at the fifty-fifth vertebra.*

Measurements of the skull.—(Mus. Pays-Bas. No. 40.) Total length, 35.6^{cm}; length of rostrum, 19.4^{cm}; breadth of rostrum at base, 8.5^{cm}; at the middle, 5.4^{cm}; breadth of intermaxillæ at same point, 3.2^{cm}; breadth between orbits, 14.0^{cm}; length of temporal fossa, 6.8^{cm}; depth of temporal fossa, 4.5^{cm}.

Habitat.—Cape of Good Hope.

LAGENORHYNCHUS ALBIROSTRIS Gray.

(Plate 26, figs. 1 and 2.)

Form like that of *L. acutus*, but with more swollen forehead, more attenuated and more strongly reclined dorsal fin and larger pectoral fins.

Forehead (except its base), back, and fins, black; sides, grayish black; belly, white. Base of forehead, beak, and mandible white, more or less tinged and shaded with gray. Three irregular areas of white on each side, one of which is above the base of the pectoral fin, the second below the insertion of the anterior margin of the dorsal fin, and the third below the insertion of the posterior margin of the same; all considera-

* As stated on page 92, Schlegel identifies this species with Lesson and Garnot's *D. superciliosus*, but the reasons for so doing are not apparent to the writer. Lesson and Garnot's description of the exterior of their animal is substantially as follows: Length 4 feet 2 inches (French); 30 teeth in the upper pair, 29 in the lower. Back, head, and muzzle black. Dorsal (situated in the middle of the back), pectoral, and caudal brown. Sides and belly white like satin. A white band passes above the eye and extends to the forehead; a white blotch near the tail. (Zool. Voy. Coquille, 1, pt. 1, 1826, p. 181.)

bly mottled with black, gray, and brown. A similar light area in the median line of the back behind the blow-hole and another on the tail, near the insertion of the flukes; under side of fluke grayish.

The light areas of the sides are sometimes indistinct, or absent.

Teeth $\frac{26}{26}$; Vertebræ: C. 7, D. 15(–16), L. 23(–24), Ca. 43(–45)=88 (–92). Skull similar to that of *L. acutus*. Rostrum short, broad, and pointed; its breadth at the base two-thirds its length. Intermaxillæ broad and flat, their outer margin convex. Temporal fossæ moderate, elliptical, not strongly directed upward.

Measurements of the exterior.—(♂, young. From Clark.) Total length, 65½ inches (166.4^{cm}); distance from extremity of snout to base of dorsal fin, 30 inches (76.2^{cm}); vertical height of dorsal fin, 6 inches (15.2^{cm}); length of pectoral fin, 12 inches (30.5^{cm}); breadth of flukes, 15 inches (38.1^{cm}).

Measurements of the skull.—(N. N. Mus. Sci. and Art, Edinburgh.) Total length, 46^{cm}; length of rostrum, 22.9^{cm}; breadth of same at base, 15.2^{cm}; at its middle, 8.7^{cm}; breadth between orbits, 23.5^{cm}; length of temporal fossa, 7.9^{cm}.

Habitat.—North Atlantic Ocean; Baltic Sea, Kiel (*Claudius*); North Sea; Irish Channel; Faröe Islands; Greenland (*Reinhardt*); Davis Strait (*Eschricht*).

LAGENORHYNCHUS OBLIQUIDENS Gill.

(Plate 27, figs. 1 and 2.)

In form, and also probably in coloration, nearly identical with *L. acutus*. "The animal is rather thick in proportion to its length; black above, with a strongly falcate dorsal. Below, white, to the edge of the patch passing from the lower lip below the pectorals and terminating a short distance behind the vent. A broad gray smouch on each side above the line of the black color, and interrupted about the middle of the animal on each side; the edges of the gray are ill-defined. The posterior edges of the pectorals and dorsal are also grayish." (Dall.)

"Greenish black on the upper surface, lightened on the sides with broad longitudinal stripes of white, gray, and dull black, which in most examples run into each other, but below it is of a pearly or snowy white. The posterior edge of the dorsal fin is tipped with dull white or gray, and sometimes the flukes are marked in the same manner." (Scammon.)

Teeth $\frac{31}{31}$. Vertebræ: C. 7, D. 13, L. 24, Ca. 30=74.

Skull similar in general appearance to that of *L. acutus*, but somewhat less broad in proportion to its length (the width between the orbits is less than the length of the rostrum.) Premaxillæ more or less rounded, their outer margins not strongly sinuate. Temporal fossæ large and rounded. Pterygoid bones not in contact in the median line, widely

divergent posteriorly; their postero-internal free margin sigmoid in outline. Vomer visible in the median line of the palate along almost the entire distal half of the same, being replaced by the interno-inferior edge of the intermaxillæ only at the extremity of the rostrum.

Measurements of the exterior.—(From Dall.) Total length, 87 inches (221^{cm}); breadth of flukes, 24 inches (61^{cm}); extremity of snout to anterior edge of dorsal fin, 36 inches (91.4^{cm}).

Measurements of the skull.—(U. S. National Museum, n. n., adult.) Total length, 41.3^{cm}; length of rostrum 20.9^{cm}; breadth of rostrum at base, 11.8^{cm}; at its middle, 8.1^{cm}; breadth between orbits, 19.2^{cm}; length of temporal fossa, 8.4^{cm}; depth of temporal fossa, 6.8^{cm}.

Habitat.—North Pacific Ocean; Monterey, California; Puget Sound (*U. S. Nat. Mus.*).

LAGENORHYNCHUS THICOLEA Gray.

(Plate 24, fig. 2.)

Teeth $\frac{45}{42}$. Rostrum long and narrow, its breadth at the middle about one-fourth its length; intermaxillæ flat and narrow; their combined breadth at the middle of the beak contained seven and a half times in the length of the beak. Temporal fossæ small and rounded. Margins of proximal half of rostrum thickened; the superior surface of the maxillæ in this part at a different angle from the plane of the distal half of the rostral part of the maxillæ, which looks downward and forward.

Measurements of the skull.—(British Museum, 934*a*. Type.) Total length, 37.5^{cm}; length of beak, 21^{cm}; breadth of beak at its base, 9.7^{cm}; at its middle, 5.3^{cm}; breadth of intermaxillæ at same point, 2.8^{cm}; breadth between orbits, 16.3^{cm}; length of temporal fossa, 5.6^{cm}.

Habitat.—? West coast of North America.

LAGENORHYNCHUS ELECTRA Gray.

(Plate 28, figs. 1 and 2.)

For exterior, see p. 102.

Teeth $\frac{28}{28}$. Skull massive; rostrum broad, long, and flat, its length always slightly exceeding one-half the total length of the skull. Intermaxillæ slightly convex on the rostrum, except in the distal third of the latter, where their outer moiety is flat; their outer margins are sinuate. Mesethmoid cartilage ossified in front of the nares to a point anterior to the maxillary notches, forming part of the superior surface of the skull. Temporal fossæ moderate and squarish; upper tooth-row short, about five-sevenths the length of the rostrum. Vomer appearing in the median line of the palate opposite the middle tooth of the upper tooth-row. Outline of combined postero-inferior free margins of pterygoid bones strongly concave. Rami of mandible deep in the proximal half and slender anteriorly; the region of the symphysis obviously deeper than

the part of the ramus which immediately succeeds it; aveolar border flat.

Measurements of the skull.—(British Museum, 359*a*. *L. electra*, Type.) Total length, 45.7^{cm}; length of rostrum, 24.35^{cm}; breadth of rostrum at base, 13.95^{cm}; at its middle, 9.2^{cm}; breadth of intermaxillæ at same point, 6.1^{cm}; breadth between orbits, 25.2^{cm}; length of temporal fossa, 9.4^{cm}; depth of temporal fossa, 5.5^{cm}.

Habitat.—Indian Ocean; tropical Pacific Ocean; Hawaii.

LAGENORHYNCHUS OBSCURUS (Gray).

(Plate 29, figs. 1 and 2.)

Form apparently like that of *L. acutus*, but the snout longer and narrower and not distinctly divided off from the head.

"Fins moderate and falcate; neck and belly white; a black band from the angle of the mouth to the pectoral fins; lateral oblique streaks of white; otherwise entirely black" (Gray).

Teeth, $\frac{32}{30}$. Skull similar to that of *L. obliquidens*, but smaller. Pterygoid bones in contact in the median line. Intermaxillæ broad proximally, more or less convex distally; outer margins straight. Length of rostrum slightly exceeding one-half the total length of the skull. Temporal fossæ moderate, elliptical; their length always exceeding the width of the beak at the middle.

Measurements of the exterior.—(British Museum, type skin, 41, 1733).* Total length, 65 inches (165.1^{cm}); extremity of snout to corner of mouth, 8.7 inches (22.1^{cm}); to base of pectoral fin, 16.5 inches (41.9^{cm}); to base of dorsal fin, 31.75 inches (80.6^{cm}); vertical height of dorsal fin, 7.5 inches (19^{cm}); length of pectoral fin, 11 inches (27.9^{cm}); breadth of flukes, 15.75 inches (40^{cm}).

Measurements of the skull.—(British Museum, 354 *a*.) Total length, 36.8^{cm}; length of rostrum, 20.1^{cm}; breadth of rostrum at base, 9.3^{cm}; at

SAGMATIAS AMBLODON Cope.

(Plate 30, fig. 1.)

Only the skull known.

Beak one-half the length of the entire cranium, and one-half as broad at the base as long. Temporal fossæ large and rounded. Intermaxillæ flat; they occupy rather more than one-half the breadth of the beak at the middle. Pterygoids short, scarcely or not touching in the median line.

Teeth $\frac{33}{32}$ (much worn in the type, but probably originally conical and acutely pointed).

***Measurements of the type skull.*—Total length, 37.2^{cm}; length of beak, 18.5^{cm}; breadth of beak at base, 9.7^{cm}; at its middle, 6.2^{cm}; length of tooth line, 15.7^{cm}; breadth between orbits, 16.7^{cm}; temporal fossæ, 7.9^{cm} × 6.1^{cm}.**

***Habitat* unknown.**

9. FERESA Gray.

Rostrum half the total length; very broad. Rostral portion of intermaxillæ flat; their inner margins separate throughout. Mandible deep between the angle and coronoid process, slender in the center of the rami and obtusely keeled at the symphysis. Teeth few and large, 11 to 12. Tooth-line extending along only the anterior two thirds of the rostrum.

Skeleton and exterior unknown.

FERESA INTERMEDIA Gray.

(Plate 30, fig. 2.)

Exterior unknown.

Teeth $\frac{11}{10}$ to $\frac{12}{13}$. Skull small but massive. Rostrum one-half the total length; very broad. Intermaxillæ moderately expanded proximally; very broad distally (they occupy rather more than two-thirds of the breadth of the rostrum at its middle); rostral portion flat (a wide space between their inner edges, in the median line of the rostrum, in which the vomer is visible nearly to the end of the rostrum). Superior nares small; the transverse diameter less than one-fourth the breadth across the orbits; narrowed antero-posteriorly by the sloping forward of the mesethenoid.

Teeth very large; upper tooth-line occupying only about two-thirds the length of the beak. Orbits short. Temporal fossæ moderate and squared. Mandible deep between the angle and coronoid process, slender opposite the middle of the tooth-line, and obtusely keeled at the symphysis, as in *Lagenorhynchus electra*.

Measurements of the skull.*—(British Museum, 362*a*. Type of *F. inter-

media.) Total length, 36.2^{cm}; length of rostrum, 17.3^{cm}; breadth of rostrum at base, 12^{cm}; breadth of rostrum at middle, 8.9^{cm}; breadth of intermaxillæ at same point, 6.1^{cm}; breadth between orbits, 21.1^{cm}; length of temporal fossa, 9.2^{cm}; depth of temporal fossa, 7.3^{cm}.

(British Museum, 1672*a*. Type of *F. attenuata.*) Total length, 35^{cm}; length of rostrum, 16.8^{cm}; breadth of rostrum at base, 10.7^{cm}; breadth of rostrum at middle, 7.5^{cm}; breadth of intermaxillæ at same point, 5.2^{cm}; breadth between orbits, 20.1^{cm}; length of temporal fossa, 8.4^{cm}; depth of temporal fossa, 7.4^{cm}.

Habitat.—South seas.

10. CEPHALORHYNCHUS Gray.

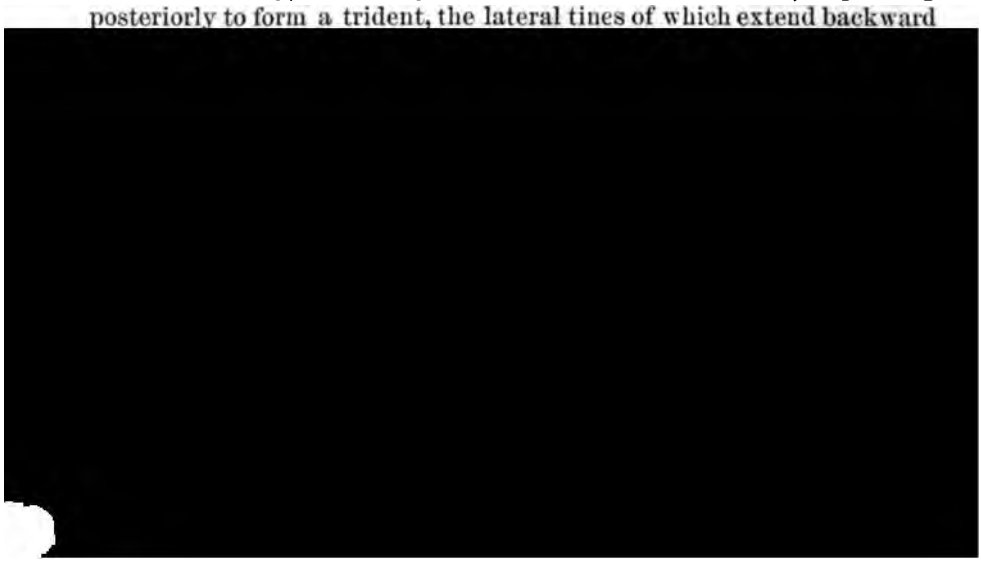
Skull small. Rostrum moderate, broad. Rostral portion of intermaxillæ flat; proximal end beveled off at the sides of the superior nares. Symphysis of mandible short. Frontal plates of maxillæ nearly in one and the same plane. Pterygoid bones separate. Teeth small, acute, 25 to 31. Vertebræ, 63 to 65.

Size small. Head conical. Beak not marked off from the forehead. Dorsal fin triangular or ovate. Pectoral fins elliptical (falcate in *albifrons*). Black above, white below; the white of the belly forms a trident-shaped area posteriorly, the lateral tines of which extend upward obliquely on the sides.

CEPHALORHYNCHUS HEAVISIDEI Gray.

(Plate 31, figs. 1 and 2.)

General form like that of *Phocæna.* Mouth small. Pectoral fins elliptical. Dorsal fin triangular. Back, head, tail, and fins black. A large, sharply-defined area of white or pale yellow on the ventral surface of the body, extending from the breast to the vent; expanding posteriorly to form a trident, the lateral tines of which extend backward



length, 29.2cm; length of rostrum, 14cm; breadth of rostrum at its base, 7.1cm; at its middle, 5.1cm; breadth of intermaxillæ at same point, 2.8cm; breadth between orbits, 13cm; length of temporal fossa, 6.6cm; depth of temporal fossa, 4.8cm.

Habitat.—Cape of Good Hope.

CEPHALORHYNCHUS ALBIFRONS True.

(Plate 32, figs. 1 and 2.)

Like *C. heavisidei*, but somewhat larger. Dorsal fin low and ovate. Pectoral fins falcate, equal in length to the base of the dorsal. Caudal lobes narrow and directed backwards; deeply emarginate behind.

Nose and forehead pure white, bounded by a crescent of black behind the blowhole, sharply defined in front, but shading off behind to light gray, which is the uniform color of the upper surface of the body. Fins are all darker than the trunk; there is also pure black round the blowhole, cloaca, and vent. The white of the snout extends behind the eye, but the dusky color extends forward beneath the angle of the mouth. The lower aspect is white as far back as the vent, but is crossed by an isthmus of dark gray beneath the pectorals. The white band is continued by two lateral stripes that ascend on the flanks. (Hector.)

Teeth $\frac{31}{31}$. The skull resembles that of *C. heavisidei*, but the rostrum equals one-half the total length, and the pterygoid bones are long and constricted at the base. Length of adult skull, 14 inches.

Measurements of the exterior. (Hector.)—Total length, 51 inches (129.5cm); extremity of snout to dorsal fin, 24 inches (60.9cm); to pectoral fin, 12 inches (30.5cm); length of base of dorsal fin, 8 inches (20.3cm); breadth of flukes, 15 inches (38.1cm).

Habitat.—New Zealand (*Hector*).

CEPHALORHYNCHUS HECTORI (Van Beneden).

(Plate 33, fig. 1.)

Head conical, elongated; the snout only indistinctly marked off from the forehead. Pectoral fins linear, obtusely pointed. Dorsal fin low, ovate, strongly reclined. Caudal lobes narrow and strongly directed backwards.

Snout, forehead, back, sides, and fins dark gray or black, the latter color most pronounced on the sides. A broad transverse band of gray between the pectoral fins, which is abruptly joined posteriorly by a broad white longitudinal band which extends along the median line of the belly to the vent, behind which it breaks up into a trident-shaped area, the central tine of which continues along the median line of the belly nearly to the flukes, while the lateral tines pass obliquely upward and backward on the sides.

Teeth $\frac{30}{27}$. Vertebræ, C. 7; D. 14; L. 15; Ca. 27=63. Skull like that of *C. heavisidei*, but the pterygoid region contracted at the base; the palatine and pterygoid bones long.

Habitat.—New Zealand.

CEPHALORHYNCHUS EUTROPIA (Gray).

(Plate 33, fig. 2.)

Exterior unknown.

Teeth, $\frac{30}{31}$. Skull larger than that of *C. heavisidei*, which it closely resembles. Length of rostrum exceeding one-half the total length of the skull. Pterygoid bones long, not widely separated in the median line, their inner free margins parallel in the proximal half. Vomer terminating near the middle of the rostrum. Temporal fossæ moderate, squared, *i. e.*, about as deep as long.

Measurements of the skull.—(U. S. National Museum, No. 21167. ?Chili.) Total length, 34.3^{cm}; length of rostrum, 18.7^{cm}; breadth of rostrum at the base, 7.6^{cm}; at its middle, 6.1^{cm}; breadth of the intermaxillæ at the same point, 2.5^{cm}; breadth between orbits, 13.9^{cm}; length of temporal fossa, 6.7^{cm}; depth of temporal fossa, 5.6^{cm}.

Habitat.—Coast of Chili.

11. NEOMERIS Gray.

External and cranial characters like *Phocæna*, but the dorsal fin absent, being replaced by a number rows of small rounded tubercles. Teeth, $\frac{18}{15}$ to $\frac{19}{19}$. Vertebræ, 63. Color black.

NEOMERIS PHOCÆNOIDES (Cuvier).

(Plate 34, figs. 1 and 2.)

Snout rounded; head very convex, rising posteriorly high to the dor-

Pterygoid bones very short and widely separated. Temporal fossæ much longer than deep.

Measurements of the exterior (from Murray, *N. kurrachiensis*).—Total length 45 inches (114.3^{cm}) [along the curves, 52 inches]; extremity of snout to pectoral fin, 10 inches (25.4^{cm}); breadth of flukes, 9 inches (22.9^{cm}).

Measurements of the skull.—(Mus. d'Hist. nat., Paris, *a*3086, type of *N. phocænoides*.) Total length, 18.8^{cm}; length of rostrum, 6.2^{cm}; breadth of rostrum at base, 6.6^{cm}; at the middle, 4.3^{cm}; breadth of intermaxillæ at the same point, 2.5^{cm}; breadth between orbits, 10.4^{cm}; length of temporal fossa, 5.6^{cm}.

Habitat.—Japan; India; Cape of Good Hope.

12. PHOCÆNA Cuvier.

Skull small. Rostrum short and broad. Pterygoid bones small and widely separated. Proximal end of intermaxillæ raised into irregular bosses in front of the nares; rostral portion flat. Symphysis of mandible short. Teeth peculiar; small, compressed, spade-like; the crowns entire or divided into two or three lobes; 16 to 26 in number. Vertebræ, 64 to 98.

Size small. Head conical, not beaked (prolonged into an indistinct beak in *spinipinnis*). Dorsal fin triangular, small (attenuated, strongly reclined in *spinipinnis*); anterior margin sometimes furnished with a number of tubercles or blunt spines. Pectoral fins ovate (falcate in *spinipinnis*). Color never in spots.

PHOCÆNA COMMUNIS Lesson.

(Plate 35, figs. 1 and 2.)

Head sloping; jaws equal in length; mouth longer than one-half the pectoral fin.

Body fusiform, slender. Dorsal fin beginning somewhat in front of the middle of the length, triangular; its anterior margin nearly straight; its posterior margin concave; its vertical height equal to or less than the length of the mouth; the anterior margin sometimes with a row of small tubercles. Pectoral fins irregularly ovate, obtusely pointed. Flukes broad antero-posteriorly.

Head, back, dorsal, pectoral, and caudal fins, and (usually) the margin of the lower jaw dark slate-color or blackish. Sides lighter, the dark color fading gradually and irregularly into the white belly. Sides sometimes tinged with pink or yellowish. The dark color of the margin of the lower jaw often extends backward as an irregular broad band reaching half way to the pectoral. A narrow dark line also extends from the corner of the mouth to the anterior base of the pectoral fin.

Teeth, $\frac{26}{26}$. Vertebræ, C. 7; D. 12 or 13; L. and Ca. 44 to 47; total, 64 to 67.

Rostrum thick, obtusely pointed; its margins shelving; its length between 40 and 47 per cent. of the total length of the skull, and never surpassing the breadth at the orbits. Depth of the temporal fossa contained about two and one-half times in the tooth-line. The latter equal to or more than one-third the length of the skull.

Measurements of the exterior.—(♀ adult.) Total length, 68 inches (172.7^{cm}); length of mouth, 4.75 inches (12.1^{cm}); tip of snout to dorsal fin, 29 inches (73.7^{cm}); length of pectoral fin, 7 inches (17.8^{cm}); vertical height of dorsal fin, 4 inches (10.2^{cm}; breadth of flukes, 12.5 inches (31.7^{cm}).

Measurements of the skull.—Total length, 29.3^{cm}; length of rostrum, 13.7^{cm}; breadth of beak at base, 8.5^{cm}; breadth of the same at its middle, 5.5^{cm}; breadth between orbits, 13.7^{cm}; length of temporal fossa, 6.0^{cm}; height of crown of largest tooth, .

Habitat.—North Atlantic and North Pacific Oceans; North Sea; coast of Europe; Davis Strait to 67° or 69° north latitude (*Brown*); coast of the United States, Maine to New Jersey; Alaska, Glacier Bay; Puget Sound; Mexico, Banderas Bay (*Scammon*). (Ascends rivers.)

PHOCÆNA SPINIPINNIS Burmeister.

(Plate 36, figs. 1 and 2.)

Body fusiform, stout. Head rounded, with a short, not well-defined beak. Lower jaw longer than the upper. Dorsal fin narrow, reclining, the anterior margin concave and furnished with numerous rugosities, the posterior margin convex. Pectoral fins falcate. Superior and inferior margins of the tail raised into ridges.

Teeth $\frac{16}{17}$ thick. Mouth less than one-third the length of the pectoral

PHOCÆNA DALLII True.

(Plate 37, figs. 1 and 2.)

Head sloping. Lower jaw protruding slightly beyond the upper. Mouth short. Dorsal fin beginning a little behind the juncture of the first and second thirds of the total length; moderately high and falcate, its front edge furnished with faintly marked tubercles. Pectorals as in *P. communis*. Dorsal and ventral margins of the body, between the vent and the origin of the flukes, raised into prominent thin ridges.

General color black. A cordate area of white occupies the belly and lower half of the sides, from a point in a line with the anterior margin of the dorsal fin to one considerably behind the vent. This area is faintly streaked with very fine dark lines, especially numerous near the median line, but only visible on close inspection. The dorsal fin is tipped with white. Eye blackish.

Teeth $\frac{23}{27}$, very small. Vertebral: C. 7; D. 14 (or 15); L. 27; Ca. 49=97 (or 98).

Skull as in *P. communis*, but the beak relatively shorter and flat, and the temporal fossæ smaller. The maxillaries also shorter proximally, and the mandible less deep between the coronoid process and angle. Nares very large. All the cervicals united, as are also the last four caudals. First thirty caudals with chevron bones. Formula of phalanges as follows: I, 1; II, 6; III, 4; IV, 2. The two distal phalanges of fingers 2 and 3 and the outermost of finger 4 very imperfectly ossified.

Measurements of the exterior.— ♂ adult (type). Total length, 72 inches (182.9^{cm}); length of mouth, 3.5 inches (8.8^{cm}); length from tip of snout to beginning of dorsal, 27.5 inches (69.8^{cm}); length of pectoral (anterior margin), 8 inches (20.3^{cm}); vertical height of dorsal, 6 inches (15.2^{cm}); breadth of flukes, 18.5 inches (47^{cm}).

Measurements of the skull.— ♂ adult (type). Total length, 33.3^{cm}; length of beak, 14^{cm}; breadth of beak at base, 9.5^{cm}; at middle, 5.7^{cm}; breadth between orbits, 16.5^{cm}; length of tooth-line, 12.7^{cm}; depth of temporal fossa, 2.6^{cm}.

13. ORCELLA Gray.

Rostrum short and broad; rostral portion of intermaxillæ broad.

Pterygoids widely separated from each other. Symphysis of mandible short. Teeth 12 to 14; small, conical, and acute, occupying nearly the whole length of the rostrum. Vertebræ, 62 to 63.

Head globose; beak wanting. Dorsal fin small, falcate. Pectoral fins small, broad at the base, and obtusely pointed. Color slate-gray above, lighter below, with or without irregular streaks.

ORCELLA BREVIROSTRIS Owen.

(Plate 38, figs. 1 and 2.)

Head convex from the blow-hole to the upper lip. Pectoral fins triangular—one-half as broad as long. Dorsal fin rising in the center of the back, comparatively small, falcate, obtusely pointed. "The line of the back is sharp from this fin down to the tail. The ventral line is the same for some inches behind the anus."

"Color dark slaty-blue above, almost black; a little paler below, without any streaks or marks" (Anderson and Sterndale).

Length from snout to caudal notch about 7 feet.

Habitat.—Bay of Bengal; Vizagapatam; Singapore.

ORCELLA FLUMINALIS Anderson.

Like *O. brevirostris*, but with rather smaller, lower, and more falcate dorsal fin. Head less anteriorly bulging. Pectoral fins shorter and broader.

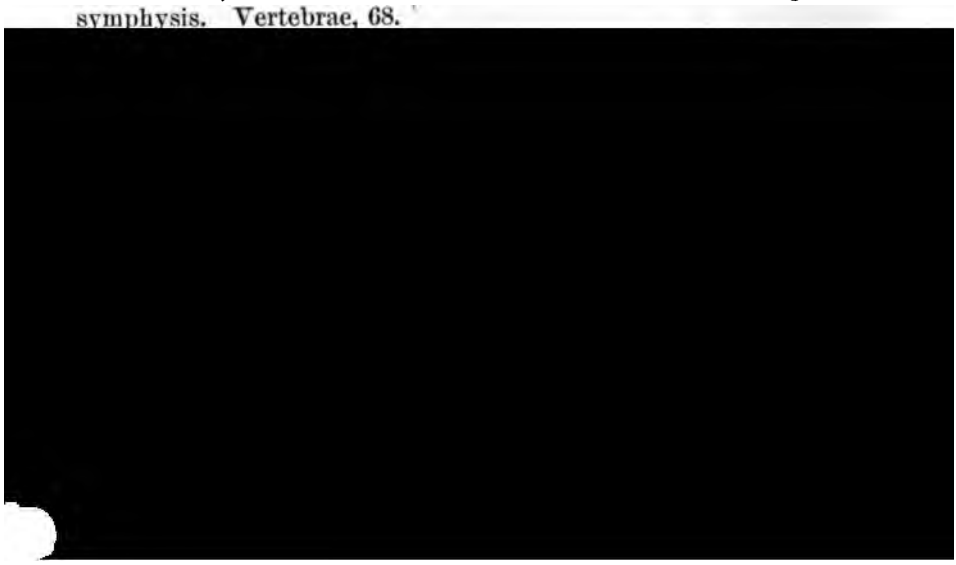
Color pale bluish above, white underneath, with numerous streaks, as in *Grampus griseus* (Anderson and Sterndale).

Length, 7 to 7½ feet.

Habitat.—Irawaddy River, Burmah, 300 to 900 miles from the sea.

14. GRAMPUS Gray.

Rostrum moderate, expanded in front of the maxillary notches, and tapering thence to an obtuse termination. Triangular area in front of the superior nares raised above the level of the surrounding bones, and convex. Rostral portion of the intermaxillæ broad and moderately rounded. Symphysis of mandible short. Pterygoid bones in contact. Teeth 2 to 7, in the mandible only, and confined to the region of the symphysis. Vertebrae, 68.



yellow. Belly grayish white. Body marked with numerous and conspicuous light-colored, irregular, and unsymmetrically-placed striæ.

Young.—Dark gray above, grayish white below. Head whitish, strongly tinged with yellow. Side with five or more narrow, vertical, and nearly equidistant lines.

Teeth $\frac{0}{6}$ to $\frac{0}{14}$. Vertebræ: C. 7; D 12; L. 19; Ca. 30 = 68.

Skull massive. Rostrum expanded in front of the maxillary notches, obtusely pointed; its length one-half the entire length of the skull. Intermaxillæ moderately convex on the rostrum; the prenareal area *elevated;* the spaces between the inner free margin become wider rather suddenly near the extremity of the rostrum. Vomer extending nearly to the extremity of the rostrum, not usually visible on the palate. Pterygoids large and prominent; largely in contact in the median line. Temporal fossæ oval, their wall largely covered by the squamosal.

Measurements of the exterior.—Adult ♀. Total length, 126 inches (320^{cm}; length of mouth, 10½ inches (26.7^{cm}); tip of snout to anterior base of dorsal fin, 47 inches; length of pectoral fin, 23¾ inches; vertical height of dorsal fin, 16 inches; breadth of flukes, 29 inches.

Measurements of the skull.—(U. S. National Museum, No. 15890. Adult. Cape Cod, Massachusetts.) Total length, 53^{cm}; length of rostrum, 26^{cm}; breadth of rostrum at base, 20.5^{cm}; breadth of rostrum at its middle, 12.8^{cm}; breadth of intermaxillæ at same point, 9^{cm}; breadth between orbits, 34.2^{cm}; length of temporal fossa, 13.3^{cm}.

Habitat.—North Atlantic and North Pacific Oceans; North Sea; Mediterranean; coast of the United States, Cape Cod; Atlantic City, N. J.; Massachusetts; Cape of Good Hope (*G. richardsoni* Gray); California (*G. stearnsii* Dall); Japan (*G. saïkamata* Gray).

15. GLOBICEPHALUS Gray.

Rostrum short and very broad. Rostral portion of intermaxillæ flat and very broad (sometimes covering the entire anterior half of the rostrum). Symphysis of mandible short. Pterygoid bones large and in contact. Teeth few and large, 7 to 11, confined to the anterior half of the rostrum. Vertebræ, 57 to 60.

Head globular, with a rounded protuberance on the lip; beak wanting; mouth oblique. Dorsal fin very long, low, and thick. Pectoral fins narrow and very long. Color black.

GLOBICEPHALUS MELAS (Traill).

(Plate 40, figs. 1 and 2.)

Size large; form stout. Head globose; forehead protuberant, overhanging the lip in adult individuals; body especially deep opposite the dorsal fin. Pectoral fins very long, slender, and pointed; length about

one-fifth the total length of the body. Dorsal fin on a long base and strongly recumbent, situated anterior to the middle of the length of the body. Caudal ridges prominent, extending respectively to the dorsal fin and to the vent. Flukes large and broad. Mouth oblique.

General color uniform black; a large hastate white area on the breast extending from the line of the corners of the mouth to the base of the pectoral fins; from behind this area a white band, which is much the broadest in the posterior half, extends backwards along the median line to the vent; the whole white area has the general form of an arrow with its head, shaft, and feathers.

Teeth $\frac{10}{10}$. Vertebræ: C. 7; D. 11; L. 13 (-14); Ca. 27(-29) = 58–60. Skull large and massive. Rostrum longer than broad at the base; its breadth at the base slightly less than three-fourths its length. Intermaxillæ large and flat; not greatly broader anteriorly than posteriorly; rugose in front; their outer margins not coinciding with the margins of the maxillæ except at the extremity of the rostrum; separated in the median line throughout. Superior nares broad transversely and bordered by narrow plates of the intermaxillæ. Vomer extending nearly to the extremity of the rostrum. Pterygoid bones large, obtusely keeled, and closely approximated in the median line. Temporal fossæ moderate, oval.

Measurements of the exterior (from Bell).—Total length, 182 inches (462.3^{cm}); extremity of snout to corner of mouth, 14.5 inches (36.8^{cm}); to dorsal fin, 55 inches (139.7^{cm}); length of pectoral fin along anterior edge, 50 inches (127^{cm}); greatest breadth of pectoral fin, 11 inches (27.9^{cm}).

Measurements of the skull.—(U. S. National Museum, No. 12100, Cape Cod, Massachusetts.) Total length, 655^{cm}; length of rostrum, 33.4^{cm}; breadth of rostrum at base, 24.1^{cm}; at its middle, 19.4^{cm}; breadth of intermaxillæ at same point, 15.4^{cm}; breadth between orbits, 42.3^{cm}; length of temporal fossa, 17.3^{cm}.

Habitat.—Atlantic coast of North America to New Jersey; coast of Europe; Cape of Good Hope; New Zealand.

GLOBICEPHALUS BRACHYPTERUS Cope.

(Plate 41, fig. 1.)

In form and size like *G. melas*. Pectoral fins shorter, their length about one-sixth the total length of the body, or less. Dorsal fin situated far forward, usually at the juncture of the anterior and second fourths of the length of the body.

Color entirely black.

Teeth, $\frac{8}{8}$. Vertebræ: C. 7; D. 11; L. 11; Ca. 28=57. Skull large and massive. Intermaxillæ large and flat; greatly expanded anteriorly, covering the anterior half of the rostral part of the maxillæ and projecting over their margins. The distance from the maxillary notch

to the point of greatest enlargement of the intermaxillæ is contained about two and a half times in the length of the rostrum. Rostrum broad, its breadth at the base exceeding four-fifths its length. Temporal fossæ large and oval. Superior nares narrow transversely, and bordered laterally by broad plates of the intermaxillæ. Pterygoids as in *G. melas*, not strongly adpressed; the sinus wide as well as deep.

Measurements of the exterior.—(♂. Dam Neck Mills, Va.) Total length, 183 inches (464.8^{cm}); tip of snout to dorsal fin, 47.5 inches (120.6^{cm}); to base of pectoral fin, 36 inches (91.4^{cm}); length of pectoral fin, 30 inches (76.2^{cm}); vertical height of dorsal fin, 14 inches (35.6^{cm}); breadth of flukes, 46 inches (116.8^{cm}).

Measurements of the skull.—(U. S. National Museum. ♂. No. 22561. Dam Neck Mills, Va.) Total length, 66.2^{cm}; length of rostrum, 33.3^{cm}; breadth of rostrum at base, 28.8^{cm}; at its middle, 23.5^{cm}; breadth of intermaxillæ at same point, 22.9^{cm}; breadth between orbits, 45^{cm}; length of temporal fossa, 16.3^{cm}.

Habitat.—Atlantic coast of North America, from New Jersey to the Gulf of Mexico and the West Indies.

GLOBICEPHALUS SCAMMONI Cope.

(Plate 42, figs. 1 and 2.)

Size and form of *G. brachypterus*. Pectoral fins proportionally a little longer.

Color entirely black.

Teeth, $\frac{8}{8}$. Skull large and very massive. Rostrum broad, its breadth at the base about four-fifths its length. Intermaxillæ flat, except in front; greatly expanded distally, covering the anterior half of the rostral portion of the maxillæ, but not projecting over their lateral margins. The greatest expansion of the intermaxillæ is opposite the junction of the proximal and second fourths of the longitudinal axis of the rostrum. Temporal fossæ oval and smaller than in *G. brachypterus*. Superior nares broad and bordered by narrow plates of the intermaxillæ; pterygoid bones closely approximated, short and strongly adpressed; the sinus deep, but narrow antero-posteriorly. Tubercles of the intermaxillæ very strong.

Measurements of the exterior.—(♂. From Scammon.) Total length, 186 inches (472.4^{cm}); tip of snout to dorsal fin, 54 inches (137.2^{cm}); to pectoral fin, 33 inches (83.8^{cm}); length of pectoral fin, 34 inches (86.4^{cm}); breadth of flukes, 42 inches (106.7^{cm}).

Measurements of skull.—(U. S. National Museum, No. 9074.) Total length, 69^{cm}; length of rostrum, 34^{cm}; breadth of rostrum at base, 30.8^{cm}; at its middle, 25.2^{cm}; breadth of intermaxillæ at the same point, 23.6^{cm}; breadth between orbits, 48.7^{cm}; length of temporal fossa, 14.8^{cm}.

Habitat.—North Pacific Ocean.

GLOBICEPHALUS SIEBOLDII Gray.

(Plate 43, figs. 1 and 2.)

Known only from a young individual.

Form and color as in *G. brachypterus*. Pectoral fins broad in the distal half, with irregular sinuate margins.

Teeth $\frac{10}{10}$. Vomer bifurcated at the extremity.

See page 142.

Habitat.—Japan.

GLOBICEPHALUS INDICUS Blyth.

See page 137.

Habitat.—India.

GLOBICEPHALUS MACRORHYNCHUS Gray.

See page 138.

Habitat.—South Seas.

16. PSEUDORCA Reinhardt.

Rostrum short and broad. Rostral portion of the intermaxillæ broad, equal to or exceeding the breadth of the proximal end; abruptly truncated at the distal end. Pterygoid bones short, nearly or quite in contact in the median line. Palatine bones prolonged laterally across the optic canal. Teeth few and large, with conical roots, 10. Vertebræ, 50.

Head globose, depressed; beak wanting. Dorsal and pectoral fins rather small, narrow, and falcate. Color uniform black.

PSEUDORCA CRASSIDENS (Owen).

(Plate 44, figs. 1 and 2.)

Pterygoid bones short and adpressed; not in contact in the median line. Temporal fossæ long and rectangular.

Measurements of the skull.—(Roy. Coll. Surg. London, No. 2985. Old. Tasmania.) Total length, 59.5cm;* length of rostrum, 28.7cm; breadth of rostrum at base, 20.8cm; at its middle, 18.8cm; breadth of intermaxillæ at same point, 13.2cm; breadth between orbits, 33.3cm; length of temporal fossa, 19.1cm.

Habitat.—Pelagic.

17. ORCA Gray.

Size very large. Rostrum broad and moderately elongated. Rostral portion of intermaxillæ narrow and flat. Pterygoid bones separate. Teeth few, 10 to 13; very large, with flattened roots. Vertebræ, 52.

Head conical and depressed; beak wanting. Dorsal fin large and prominent (remarkably so in the male). Pectoral fins large and very broadly ovate. Color black, with a large and sharply contrasted ventral area of white, forming a trident posteriorly, the lateral tines of which extend up on the sides.

ORCA GLADIATOR (Lacépède).

(Plate 45, figs. 1 and 2.)

Cranial characters of the genus.

Size very large. Head broad, conical, and depressed. Dorsal fin erect, extraordinarily high in the male. Pectoral fins short and broad.

Upper half of head, back, and fins black. Lower jaw, breast, and belly whitish. The white area forms a trident posteriorly, the central tine of which extends back to the vent, while the lateral tines extend obliquely upward and backward on the sides. A large white blotch behind the eye. A crescent-shaped area of purple extends across the median line of the back behind the dorsal fin (? sometimes obsolete).

Habitat.—Pelagic.

Subfamily II. DELPHINAPTERINÆ.

18. DELPHINAPTERUS Lacépède.

DELPHINAPTERUS LEUCAS (Pallas).

(Plate 46, figs. 1 and 2.)

Size moderate. Head globose, not prolonged into a snout. Neck marked by a slight constriction. No dorsal fin, the center of the back rising instead into a low, irregular ridge. Pectoral fins short, very broad across the center, and obtusely pointed.

Color white throughout.

* A little sawn off the end of the rostrum.

Teeth $\frac{9}{9}$, obliquely and often very irregularly implanted, and of varying size. Vertebræ: C. 7; D. 11; L. 9; Ca. 23=50.

Rostrum of skull rather less than half the total length; broad at the base, tapering rapidly to the middle, but with the margins of the distal half approximately parallel. Intermaxillæ broad and moderately convex, rarely extending backward to the posterior wall of the superior nares. Expanded proximal portion of maxillæ not bent upward as in other dolphins, so that the entire upper surface of the skull is nearly in one and the same plane. Pterygoid bones far apart at the base, converging toward the extremity but not meeting; the sinus of very small proportions.

Measurements of the exterior.—Total length, 137.5 inches; tip of snout to pectoral fin, 29 inches; length of pectoral fin, 16.5 inches; greatest breadth of pectoral fin, 10.5 inches; breadth of flukes,

Measurements of the skull.—(No. 2958, R. Coll. of Surgeons, London.) Total length, 55.3^{cm}; length of rostrum, 26.4^{cm}; breadth of rostrum at base, 18.3^{cm}; at its middle, 9.9^{cm}; breadth between orbits, 27.2^{cm}; length of temporal fossa, 15.2^{cm}.

Habitat.—Arctic and sub-Arctic seas; north to 81° 35′ (*Greely*), straggling southward to Firth of Forth, Scotland, and Cape Cod, Massachusetts.

19. MONODON Linné.

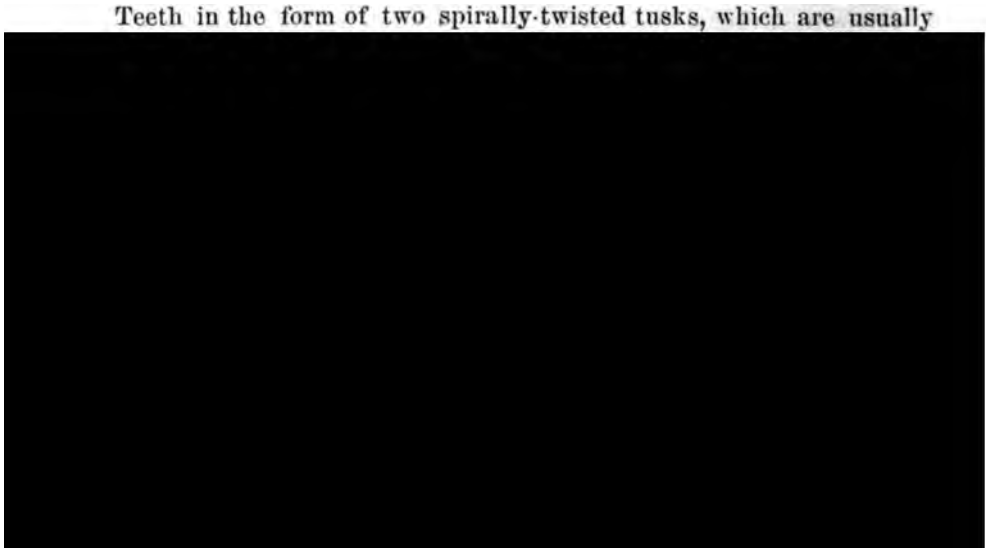
MONODON MONOCERAS Linné.

(Plate 47, figs. 1 and 2.)

Head short and rounded. Pectoral fins short and broad. Dorsal fin rudimentary; a low ridge.

Color above dark gray or dusky; below, white; sides and back mottled with gray.

Teeth in the form of two spirally-twisted tusks, which are usually



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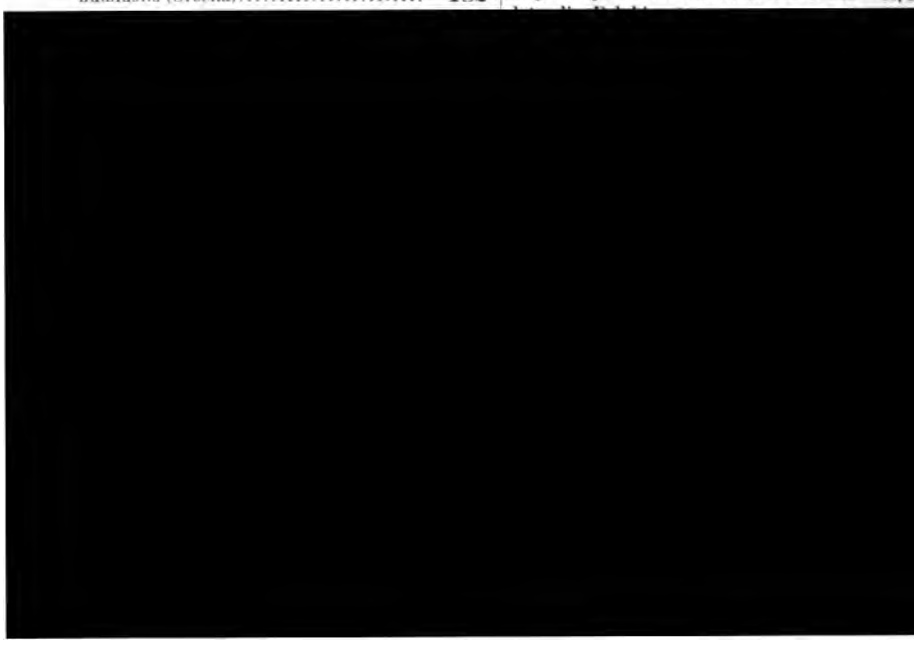
The first number in heavy-faced type indicates the page on which the discussion of a species begins in the Review; the second indicates the page on which the diagnosis occurs in the Synopsis.]



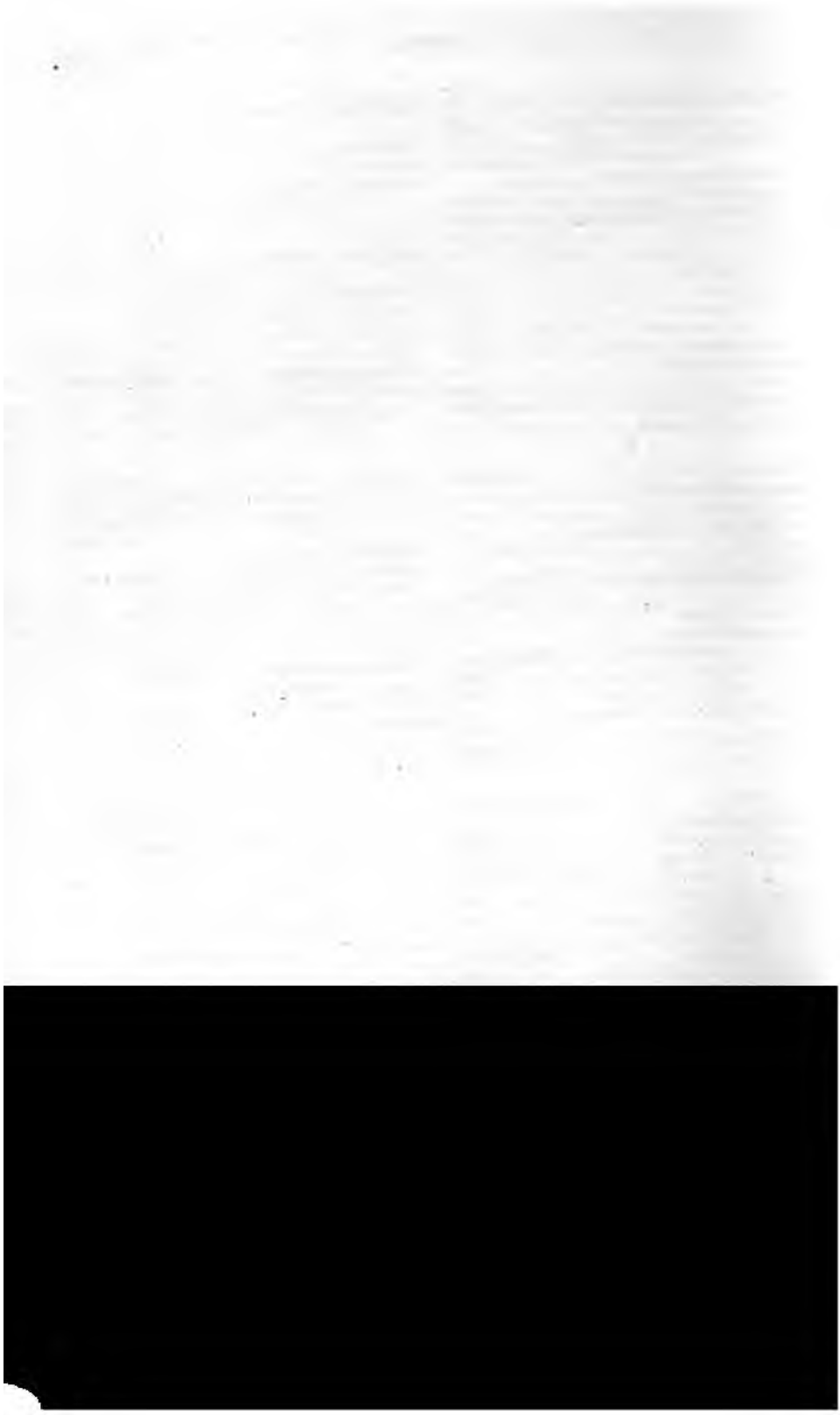


FIG. 1. *Sotalia plumbea* (Cuvier).
(After F. Cuvier.)

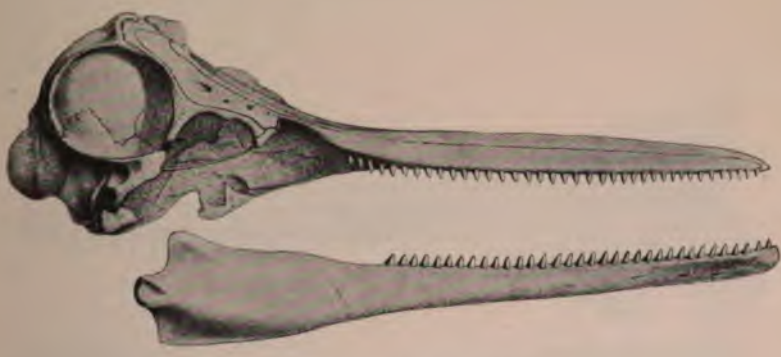


FIG. 2. *Sotalia plumbea* (Cuvier).
(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868-'79, pl. 37, figs. 1 and 2.)

FIG. 3. CHINESE WHITE DOLPHIN.
Sotalia sinensis Flower.
(From Flower, Transactions of the Zoological Society of London, vii, pl. 17, fig. 2.)

GENUS SOTALIA.

FIG. 1. *Sotalia gadamu* (Owen).

(From Owen, Transactions of the Zoological Society of London, vi, 1869, pl. 3, fig. 1.)

FIG. 2. *Sotalia gadamu* (Owen).

(From Owen, Transactions of the Zoological Society of London, vi, pl. 4, figs. 1–2.)

FIG. 3. *Sotalia lentiginosa* (Owen).

(From Owen, Transactions of the Zoological Society of London, vi, 1869, pl. 5, fig. 2.)

GENUS SOTALIA.

FIG. 1. *Sotalia brasiliensis* E. Van Beneden. Young.
(From E. Van Beneden, Mémoires de l'Académie Royale de Belgique, xli, 1874.)

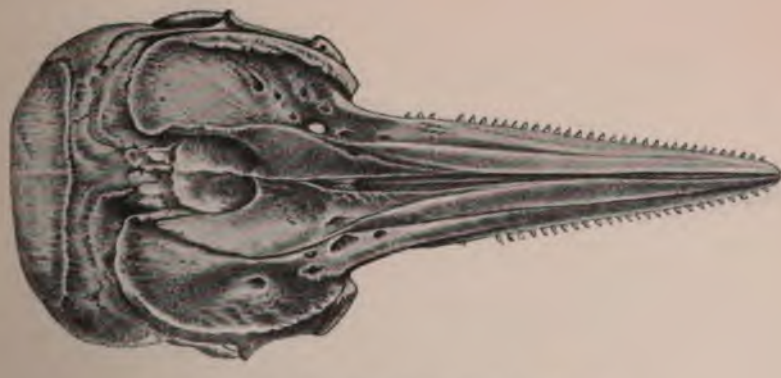


FIG. 2. *Sotalia brasiliensis* E. Van Beneden. Young.
(From E. Van Beneden, Mémoires de l'Académie Royale de Belgique, xli, 1874.)

GENUS SOTALIA.

FIG. 1. *Sotalia pallida* (Gervais).

(From Castelnau, Expédition dans l'Amérique du Sud, pt. 7, Zoologie, i, 1855, pl. 19, fig. 1.)

FIG. 2. *Sotalia pallida* (Gervais).

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868-'79, pl. 41, fig. 6*a*.)

GENUS SOTALIA.

FIG. 1. *Sotalia fluviatilis* (Gervais).

(From Castelnau, Expédition dans l'Amérique du Sud, pl. 7, Zoologie, 1855, pl. 9, fig. 1.)

FIG. 2. *Sotalia tucuxi* Gray.

(From a photograph of the type-skull, No. 1189*a*, ♂, in the British Museum.)

GENUS SOTALIA.

FIG. 1. *Steno rostratus* (Desmarest).

(From Lütken, K. Danske Videnskabs Selskabs Skrifter, 6te Række, v, 1889, pl. 1.)

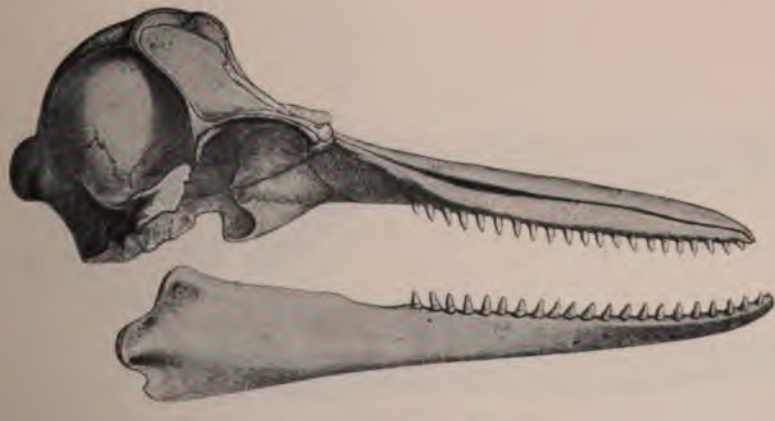


FIG. 2. *Steno rostratus* (Desmarest).

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868-'79, pl. 37, fig. 10.)

GENUS STENO.

FIG. 1. *Steno perspicillatus* Peters.

(From Peters, Monatsbericht der k. Akademie der Wissenschaften, Berlin, 1876, pl. 2.)

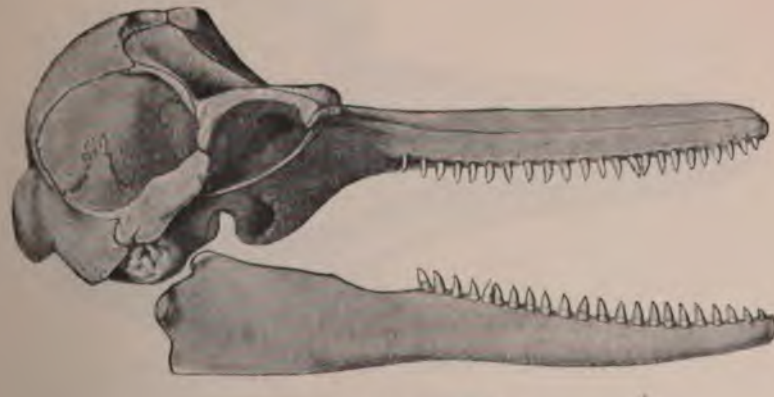


FIG. 2. *Steno perspicillatus* Peters.

(From Peters, Monatsbericht der k. Akademie der Wissenschaften, Berlin, 1876, pl. 13, fig. 1. Type-skull.)

GENUS STENO.

FIG. 1. COMMON PORPOISE; BOTTLENOSED DOLPHIN.

Tursiops tursio (Fabricius).

(From a photograph in the U. S. National Museum.)

FIG. 2. COMMON PORPOISE; BOTTLENOSED DOLPHIN.

Tursiops tursio (Fabricius).

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868–'79, pl. 34, fig. 3.)

GENUS TURSIOPS.

FIG. 1. *Tursiops abusalam* (Rüppell).
(From Rüppell, Museum Senckenburgianum, iii, 1845, pl. 12. fig. 1.)

FIG. 2. *Tursiops abusalam* (Rüppell).
(From Rüppell, Museum Senckenburgianum, iii, 1845, pl. 12, fig. 3.)

GENUS TURSIOPS.

FIG. 1. *Tursiops gillii* Dall.

(From Scammon, Marine Mammalia, 1874, p. 102. Approximate outlines.)

FIG. 2. *Tursiops gillii* Dall.

(From the type-skull, No 12054, in the U. S. National Museum.)

GENUS TURSIOPS.

FIG. 1. COMMON DOLPHIN.

Delphinus delphis Linné.

(From a sketch by J. H. Emerton.)

FIG. 2. COMMON DOLPHIN.

Delphinus delphis Linné.

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868–'79, pl. 39, fig. 3.)

FIG. 3. COMMON DOLPHIN.

Delphinus delphis Linné.

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868–'79, pl. 39, fig. 3.)

GENUS DELPHINUS.

FIG. 1. *Delphinus capensis* Gray.
(From Gray, Spicilegia Zoologica, 1828, pl. 2, fig. 1.)

FIG. 2. *Delphinus longirostris* Cuvier.
(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868–'79, pl. 39, fig. 10.)

GENUS DELPHINUS.

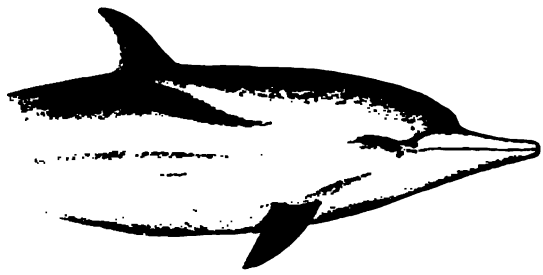
FIG. 1. *Delphinus roseiventris* Wagner.

(From Jacquinot et Pucheran, Zoologie du Voyage de l'Astrolabe et Zélée, 1853, pl. 22, fig. 2.)

FIG. 2. *Delphinus roseiventris* Wagner.

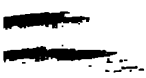
(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868-'79, pl. 38, fig. 6a.)

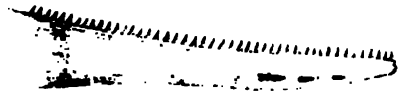
GENUS DELPHINUS.



Prodelphinus cæruleo-albus (Meyen).

...reæ Leopoldino-Carolinæ Naturæ Curiosum, xvi. 1832. pl. 43 fig 2.)





...*rulea-albus* (Meyen).

...cethere, pl. 364.)

)ELPHINUS.

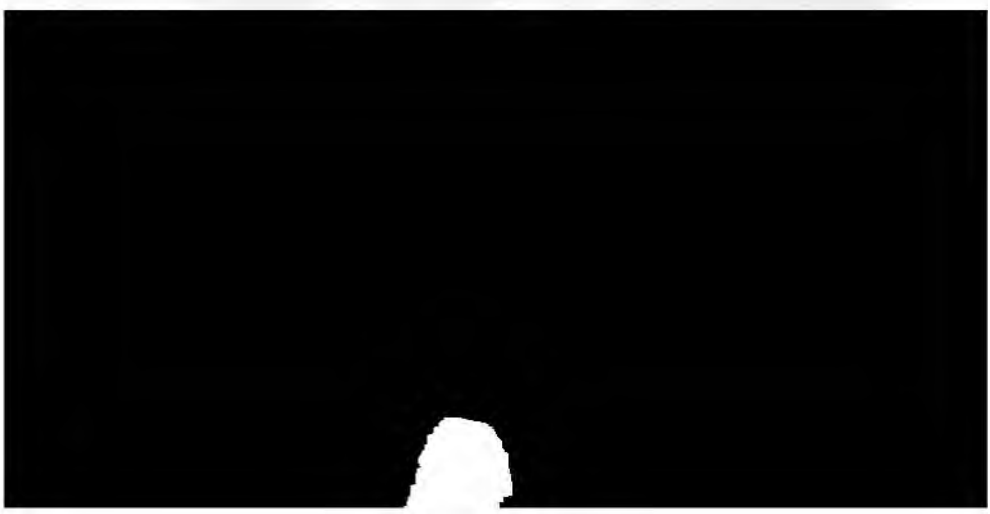


FIG. 1. *Prodelphinus euphrosyne* (Gray).

(From Pucheran, Revue et Magasin de Zoologie, 2d series, viii, 1856, pl. 25. *D. marginatus*.)

FIG. 2. *Prodelphinus euphrosyne* (Gray).

(From Gray, Synopsis of Whales and Dolphins, 1868, pl. 22.)

FIG. 3. *Prodelphinus* (?) *lateralis* (Peale).

(From Peale U. S. Exploring Expedition, Mammalogy and Ornithology, Atlas, pl. 8, fig. 1.)

GENUS PRODELPHINUS.

FIG. 1. *Prodelphinus malayanus* (Lesson).

(From Jacquinot et Pucheran, Zoologie du Voyage de l'Astrolabe et Zélée, Mammifères et Oiseaux, Atlas, pl. 21, fig. 2. *Dauphin à petites pectorales.*)

FIG. 2. *Prodelphinus malayanus* (Lesson).

(From Schlegel, Abhandlungen aus dem Gebiete der Zoologie, 1841, pl. 1, fig. 2.)

GENUS PRODELPHINUS.

FIG. 1 *Prodelphinus attenuatus* (Gray).

(From Gray Catalogue of Whales and Dolphins, 1866, p. 399, fig. 101. *C. punctata*.)

FIG. 2. *Prodelphinus attenuatus* (Gray).

(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 28.)

GENUS PRODELPHINUS.

FIG. 1. SPOTTED DOLPHIN.

Prodelphinus plagiodon (Cope).

(From a photograph taken on board the U. S. Fish Commission Steamer Albatross.)

FIG. 2. SPOTTED DOLPHIN.

Prodelphinus plagiodon (Cope).

(From the type-skull, No. 3884, in the U. S. National Museum.)

GENUS PRODELPHINUS.

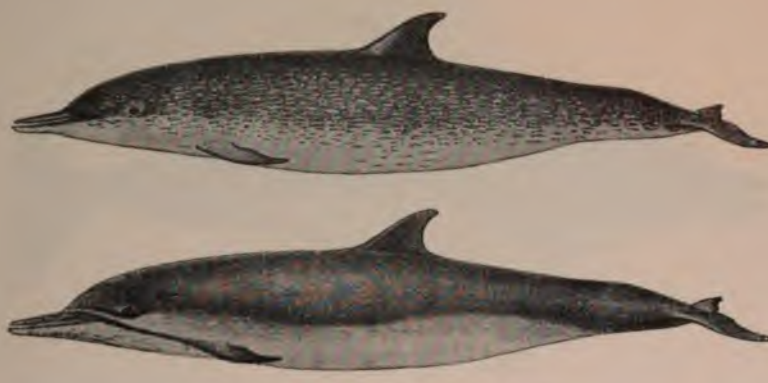


FIG. 1. *Prodelphinus frœnatus* (F. Cuvier).

(From Lütken, K. Danske Videnskabs Selskabs Skrifter, 6te Række, v. 1889. Two varieties. The form of the body is conventional.)

FIG. 2. *Prodelphinus frœnatus* (F. Cuvier).

(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 25.)

GENUS PRODELPHINUS.

FIG. 1. *Prodelphinus frœnatus* (F. Cuvier). Young.
(From F. Cuvier, Histoire naturelle des Cétacés, 1836, pl. 10, fig. 1.)

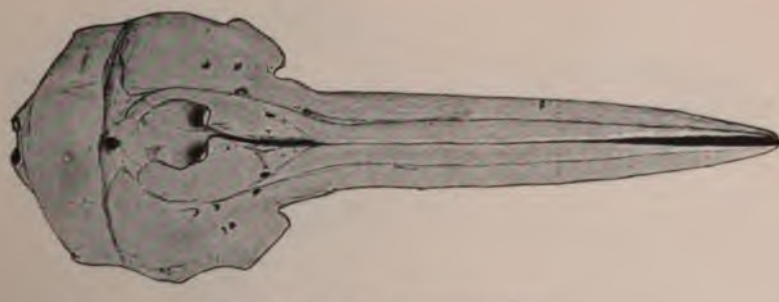


FIG. 2. *Prodelphinus longirostris* (Gray).
(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 25. *Delphinus microps*.)

GENUS PRODELPHINUS.

FIG. 1. *Tursio peronii* (Lacépède).
(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 15, fig. 1.)

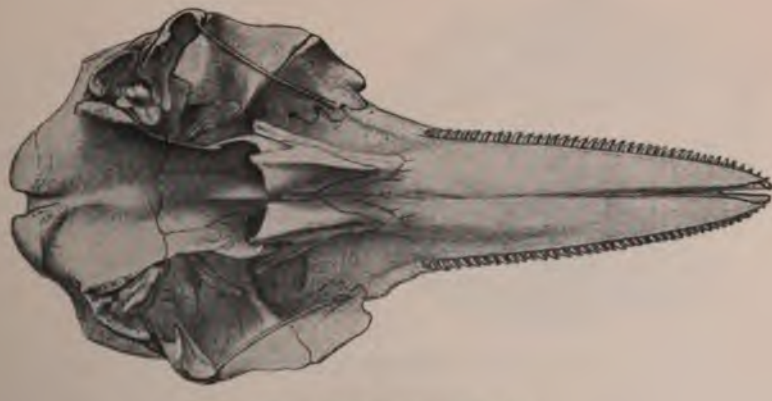


FIG. 2. *Tursio peronii* (Lacépède).
(From Van Beneden and Gervais, Ostéographie, pl. 38, fig. 3.)

GENUS TURSIO.

FIG. 1. PACIFIC RIGHT-WHALE PORPOISE.

Tursio borealis (Peale).

(From Scammon, Marine Mammalia, 1874, pl. 19, fig. 4.)

FIG. 2. PACIFIC RIGHT-WHALE PORPOISE.

Tursio borealis (Peale).

(From skull No. 8160, in the U. S. National Museum.)

GENUS TURSIO.

FIG. 1. STRIPED DOLPHIN.

Lagenorhynchus acutus Gray.

(From a photograph in the U. S. National Museum, of an individual captured at Woods Ho'l, Mass.)

FIG. 2. STRIPED DOLPHIN.

Lagenorhynchus acutus Gray.

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868–'79, pl. 36, fig. 4.)

GENUS LAGENORHYNCHUS.

FIG. 1. *Lagenorhynchus fitzroyi* (Waterhouse).
(From Waterhouse, Zoology of the Voyage of the Beagle, Mammalia, 1839, pl. 10.)

FIG. 2. *Lagenorhynchus thicolea* Gray.
(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 36.)

GENUS LAGENORHYNCHUS.

FIG. 1. *Lagenorhynchus cruciger* (d'Orbigny et Gervais).

(From d'Orbigny and Gervais, Voyage dans l'Amérique Méridionale, ix, 1847, pl. 21, fig. 4.)

FIG. 2. *Lagenorhynchus cruciger* (d'Orbigny et Gervais).

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868–'79, pl. 36, fig. 3.)

FIG. 3. *Lagenorhynchus superciliosus* (Schlegel).

(From Schlegel, Abhandlungen aus dem Gebiete der Zoologie, 1841, pl. 1, fig. 3.)

GENUS LAGENORHYNCHUS.

FIG. 1. *Lagenorhynchus cruciger* (d'Orbigny et Gervais).

(From d'Orbigny and Gervais, Voyage dans l'Amérique Méridionale, ix, 1847, pl. 21, fig. 4.)

FIG. 2. *Lagenorhynchus cruciger* (d'Orbigny et Gervais).

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868–'79, pl. 36, fig. 3.)

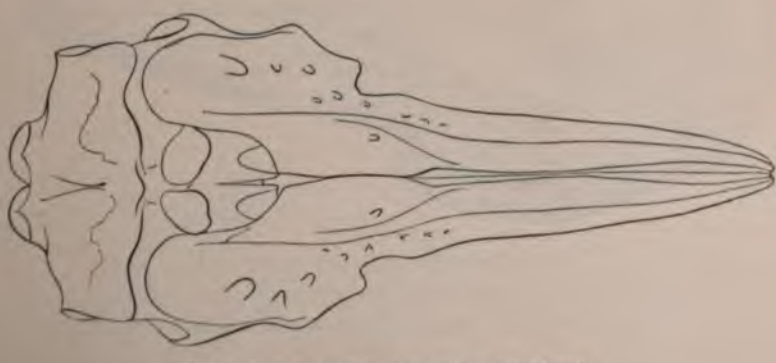


FIG. 3. *Lagenorhynchus superciliosus* (Schlegel).

(From Schlegel, Abhandlungen aus dem Gebiete der Zoologie, 1841, pl. 1, fig. 3.)

GENUS LAGENORHYNCHUS.

FIG. 1. WHITE-BEAKED DOLPHIN.

Lagenorhynchus albirostris Gray.

(From Lütken, Kgl. Danske Videnskabs Selskabs Skrifter, 6tr Række, iv, 1887, pl. 2.)

FIG. 2. WHITE-BEAKED DOLPHIN.

Lagenorhynchus albirostris Gray.

(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 11.)

GENUS LAGENORHYNCHUS.

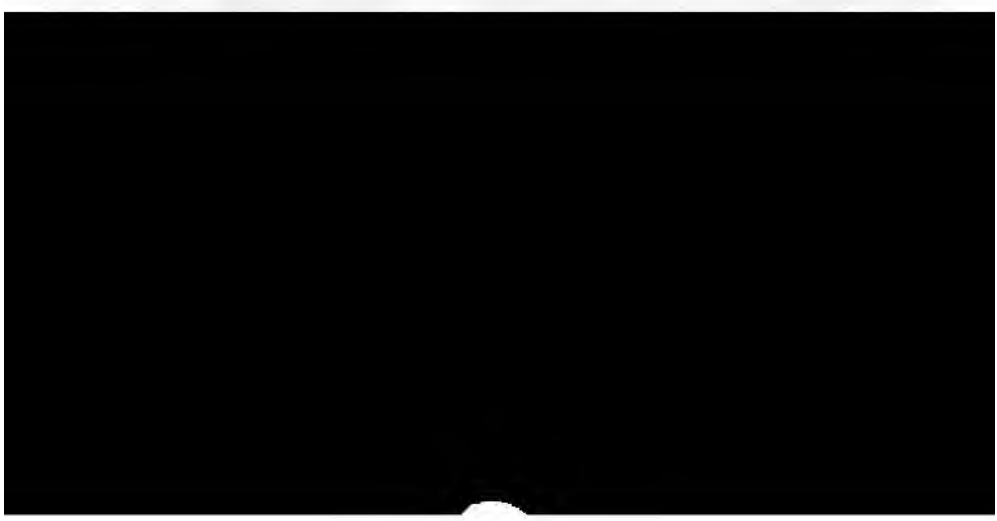


FIG. 1. *Lagenorhynchus obliquidens* Gill.
(From Scammon, Marine Mammalia, 1874, pl. 19, fig. 2.)

FIG. 2. *Lagenorhynchus obliquidens* Gill.
(From the type-skull, No. 1963, in the U. S. National Museum.)

GENUS LAGENORHYNCHUS.

FIG. 1. *Lagenorhynchus electra* Gray.

(From Peale, U. S. Exploring Expedition, Mammalogy and Ornithology, Atlas, pl. 5, fig. 2.)

FIG. 2. *Lagenorhynchus electra* Gray.

(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 14.)

GENUS LAGENORHYNCHUS.

FIG. 1. *Lagenorhynchus obscurus* (Gray).
(From Gray, Spicilegia Zoologica, 1828, pl. 2, fig. 3.)

FIG. 2. *Lagenorhynchus obscurus* (Gray).
(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 16.)

GENUS LAGENORHYNCHUS.

FIG. 1. *Sagmatias amblodon* Cope.
(From the type-skull, No. 3887, in the U. S. National Museum.)

FIG. 2. *Feresa intermedia* Gray.
(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 8.)

GENERA SAGMATIAS AND FERESA.

FIG. 1. *Cephalorhynchus heavisidei* Gray.

(From P. J. Van Beneden, Bulletin de l'Académie Royale de Belgique, 2d series, xxxvi, 1873, pp. 32-40, 1 pl.)

FIG. 2. *Cephalorhynchus heavisidei* Gray.

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868-'79, pl. 36, fig. 1.)

GENUS CEPHALORHYNCHUS.

FIG. 1. *Cephalorhynchus albifrons* True.
(From Hector, Transactions of the New Zealand Institute, v, 1873, pl. 3.)

FIG. 2. *Cephalorhynchus albifrons* True.
(From Hector, Transactions of the New Zealand Institute, v, 1873.)

GENUS CEPHALORHYNCHUS.

FIG. 1. *Cephalorhynchus hectori* (Van Beneden).
(From Van Beneden, Bulletin de l'Académie Royale de Belgique, 3d series, i, 1881, pl. 2.)

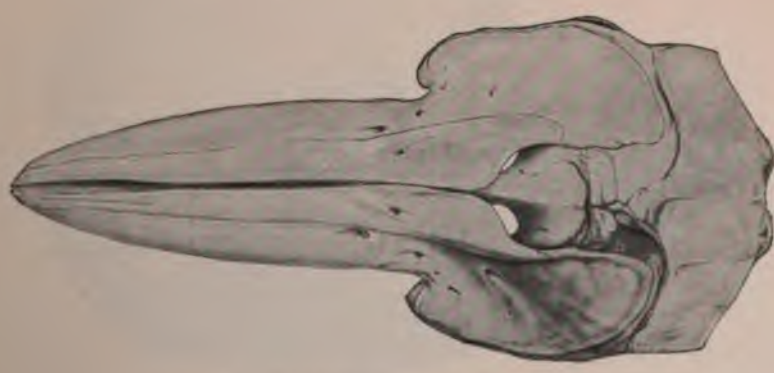


FIG. 2. *Cephalorhynchus eutropia* (Gray).
(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 34.)

GENUS CEPHALORHYNCHUS.

FIG. 1. NAMENO-JUO.

Neomeris phocænoides (Cuvier).

(From Schlegel, Fauna Japonica, 1850, pl. 25, fig. 1.)

FIG. 2. NAMENO-JUO.

Neomeris phocænoides (Cuvier).

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868-'79, pl. 56, fig. 1.)

GENUS NEOMERIS.

FIG. 1. HARBOR PORPOISE; HERRING HOG.

Phocæna communis Lesson.

(From a photograph in the U. S. National Museum.)

FIG. 2. HARBOR PORPOISE; HERRING HOG.

Phocæna communis Lesson.

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868-'79, pl. 56, fig. 10.)

GENUS PHOCÆNA.

FIG. 1. *Phocæna spinipinnis* Burmeister.
(From Burmeister, Anales del Museo Público de Buenos Aires, i, 1864–'69, pl. 23, fig. 2.)

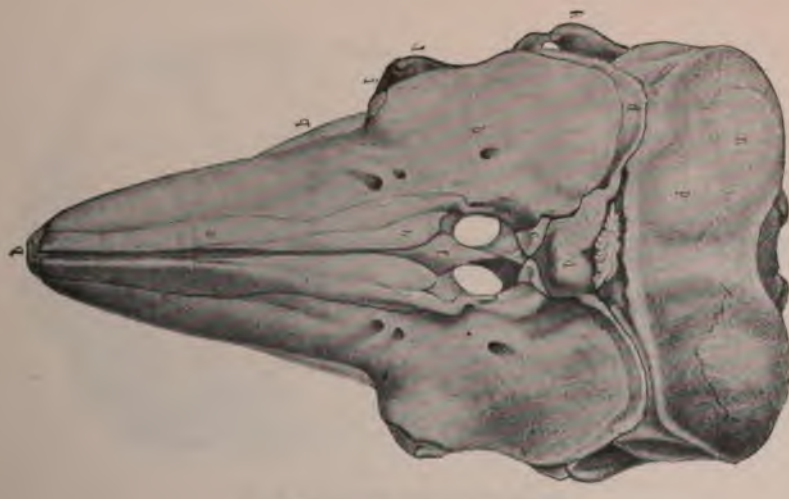


FIG. 2. *Phocæna spinipinnis* Burmeister.
(From Burmeister, Anales del Museo Público de Buenos Aires, i, 1864–'69, pl. 24, fig. 1.)

GENUS PHOCÆNA.

FIG. 1. DALL'S HARBOR PORPOISE.

Phocœna dallii True.

(From a drawing by William H. Dall.)

FIG. 2. DALL'S HARBOR PORPOISE.

Phocœna dallii True.

(From a drawing by William H. Dall of the type-skull, No. 21762, in the U. S. National Museum.)

GENUS PHOCÆNA.

FIG. 1. *Orcella brevirostris* (Owen).
(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868–'79, p. 552.)

FIG. 2. *Orcella brevirostris* (Owen).
(From Owen, Transactions of the Zoological Society of London, vi, 1869, pl. 9, fig. 3.)

GENUS ORCELLA.

FIG. 1. GRAMPUS.

Grampus griseus (Cuvier)

(From Flower, Transactions of the Zoological Society of London, viii, 1872, pl. 1, fig. 1.)

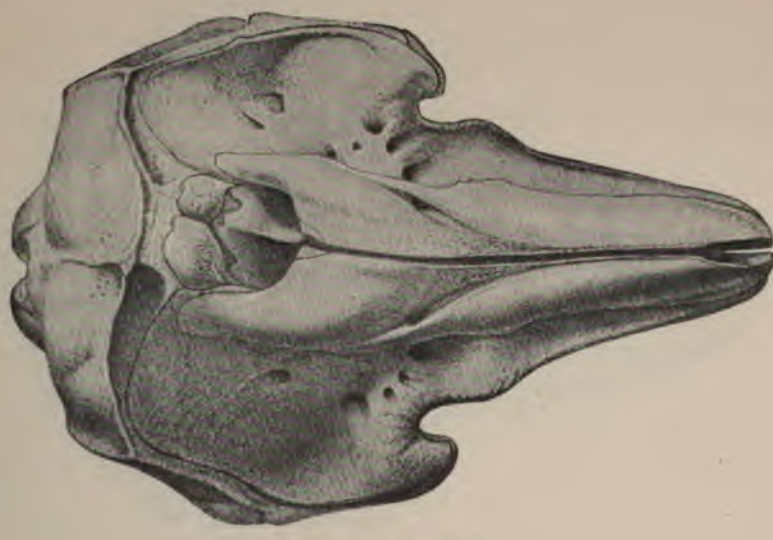


FIG. 2. GRAMPUS.

Grampus griseus (Cuvier).

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868–'79, pl. 54, fig. 7.)

GENUS GRAMPUS.

FIG. 1. COMMON BLACKFISH.

Globicephalus melas (Traill).

(From Murie. Transactions of the Zoological Society of London, viii, 1873, pl. 30, fig. 1.)

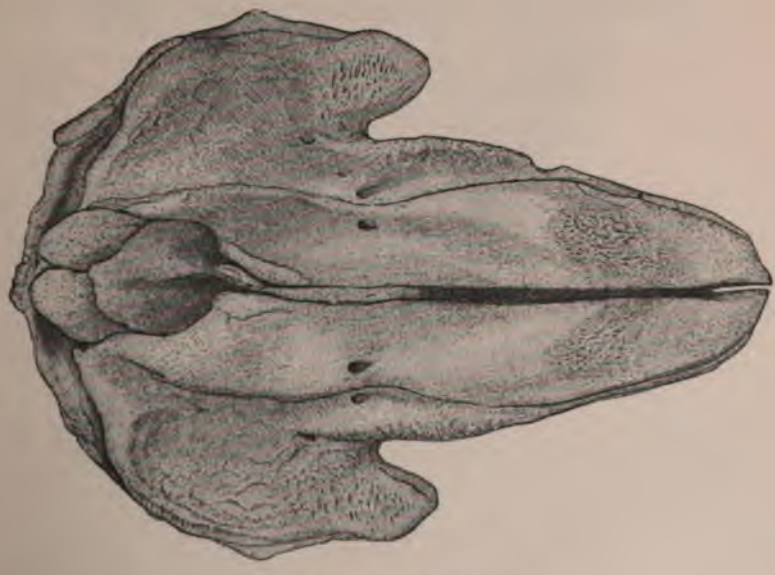


FIG. 2. COMMON BLACKFISH.

Globicephalus melas (Traill).

(From Gray, Catalogue of the Whales and Dolphins, 1866, p. 316, fig. 62.)

GENUS GLOBICEPHALUS.

FIG. 1. *Globicephalus brachypterus* Cope.

(From Cope, Proceedings of the Academy of Natural Sciences, Philadelphia, 1876, p. 131.)

GENUS GLOBICEPHALUS.

FIG. 1. NORTH PACIFIC BLACKFISH.

Globicephalus scammoni Cope.

(From Scammon, Marine Mammalia, 1874, pl. 16, fig. 1.)

FIG. 2. NORTH PACIFIC BLACKFISH.

Globicephalus scammoni Cope.

(From skull No. 9074, in the U. S. National Museum.)

GENUS GLOBICEPHALUS.

FIG. 1. *Globicephalus sieboldii* Gray.
(From Schlegel, Fauna Japonica, Mammalia, 1850, pl. 27, fig. 1.)

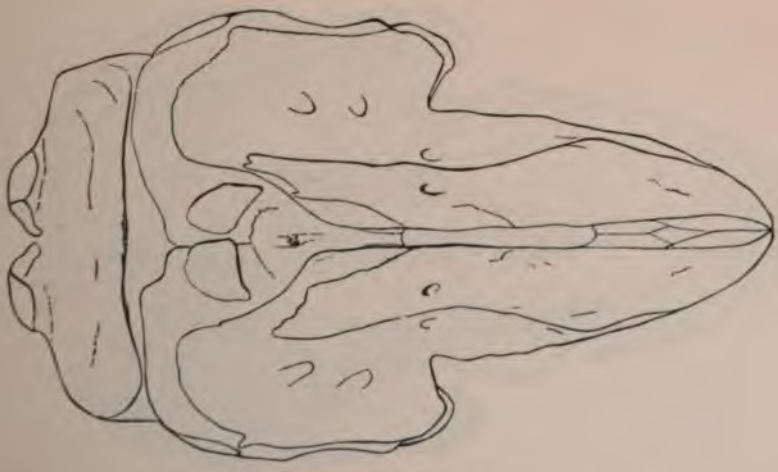


FIG. 2. *Globicephalus sieboldii* Gray.
(From Schlegel, Fauna Japonica, Mammalia, 1850, pl. 27, fig. 1.)

GENUS GLOBICEPHALUS.

FIG. 1. *Pseudorca crassidens* (Owen).

(From Reinhardt, Pseudorca crassidens, Ray Society, 1866, p. 191.)

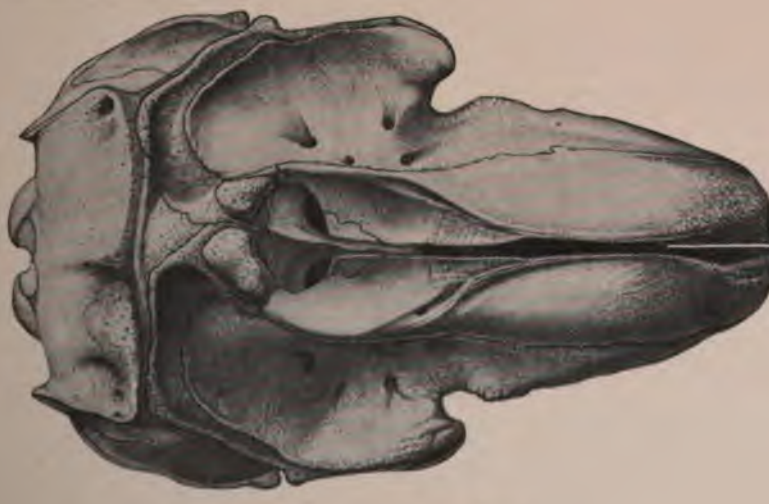


FIG. 2. *Pseudorca crassidens* (Owen).

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868–'79, pl. 50, fig. 7.)

GENUS PSEUDORCA.

FIG. 1. KILLER WHALE.

Orca gladiator (Lacépède).

(From Lütken, Kgl. Danske Videnskabs Selskabs Skrifter, 6te Række, iv, 1887, pl. 1.)

FIG. 2. *Orca gladiator* (Lacépède).

(From Lütken, Kgl. Danske Videnskabs Selskabs Skrifter, 6te Række, iv, 1887, p. 372, fig. 9.)

GENUS ORCA.

FIG. 1. WHITE WHALE.

Delphinapterus leucas (Pallas).

(From a photograph of a specimen received by the Smithsonian Institution.)

FIG. 2. WHITE WHALE.

Delphinapterus leucas (Pallas).

(From Van Beneden and Gervais, Ostéographie des Cétacés, 1868-'79, pl. 44, fig. 2.)

FIG. 3. *Delphinapterus kingii* (Gray).

(From Gray, Synopsis of the Whales and Dolphins, 1868, pl. 7.)

GENUS DELPHINAPTERUS.

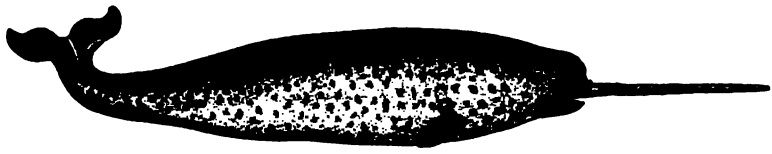


FIG. 1. NARWHAL. Male.

Monodon monoceros Linné.

(From Bell's British Quadrupeds, 2d edition, 1874, p. 435.)

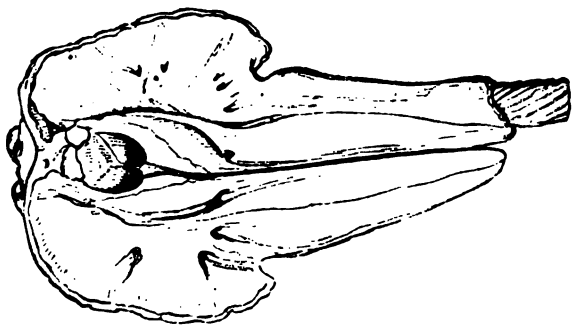


FIG. 2. NARWHAL. Male.

Monodon monoceros Linné.

(From Bell's British Quadrupeds, 2d edition, 1874, p. 439.)

GENUS MONODON.

SMITHSONIAN INSTITUTION:
UNITED STATES NATIONAL MUSEUM.

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 37.

A PRELIMINARY CATALOGUE OF ... BEARING MARINE MOLLUSKS AND ... OF THE SOUTHEASTERN COAST OF THE UNITED ... WITH ILLUSTRATIONS OF MANY OF THE SPECIES.

BY

WILLIAM HEALEY DALL, A. M.,
Honorary Curator Department of Mollusks, U. S. National Museum.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1890.

SMITHSONIAN INSTITUTION:
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No. 37.

A PRELIMINARY CATALOGUE OF THE SHELL-BEARING MARINE MOLLUSKS AND BRACHIOPODS OF THE SOUTHEASTERN COAST OF THE UNITED STATES, WITH ILLUSTRATIONS OF MANY OF THE SPECIES.

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ADVERTISEMENT.

The present publication (Bulletin No. 37) is the forty-eighth of a series of papers intended to illustrate the collections of natural history and ethnology belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

The publications of the National Museum consist of two series—the Bulletins, of which this is No. 37, in continuous series, and the Proceedings, of which the eleventh volume is now in press.

The volumes of the Proceedings are printed, signature by signature, each issue having its own date, and a small edition of each signature is distributed to libraries promptly after its publication.

Full lists of the publications of the Museum may be found in the current catalogues of the publications of the Smithsonian Institution.

Papers intended for publication in the Proceedings and Bulletins of the National Museum are referred to the Committee on Publications, consisting of the following members: T. H. Bean, A. Howard Clark (editor), Otis T. Mason, John Murdoch, Leonhard Stejneger, Frederick W. True, and Lester F. Ward.

S. P. LANGLEY,

A PRELIMINARY CATALOGUE

OF THE

SHELL-BEARING MARINE MOLLUSKS AND BRACHIOPODS

OF THE

SOUTH-EASTERN COAST OF THE UNITED STATES,

WITH ILLUSTRATIONS OF MANY OF THE SPECIES.

BY

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WASHINGTON:
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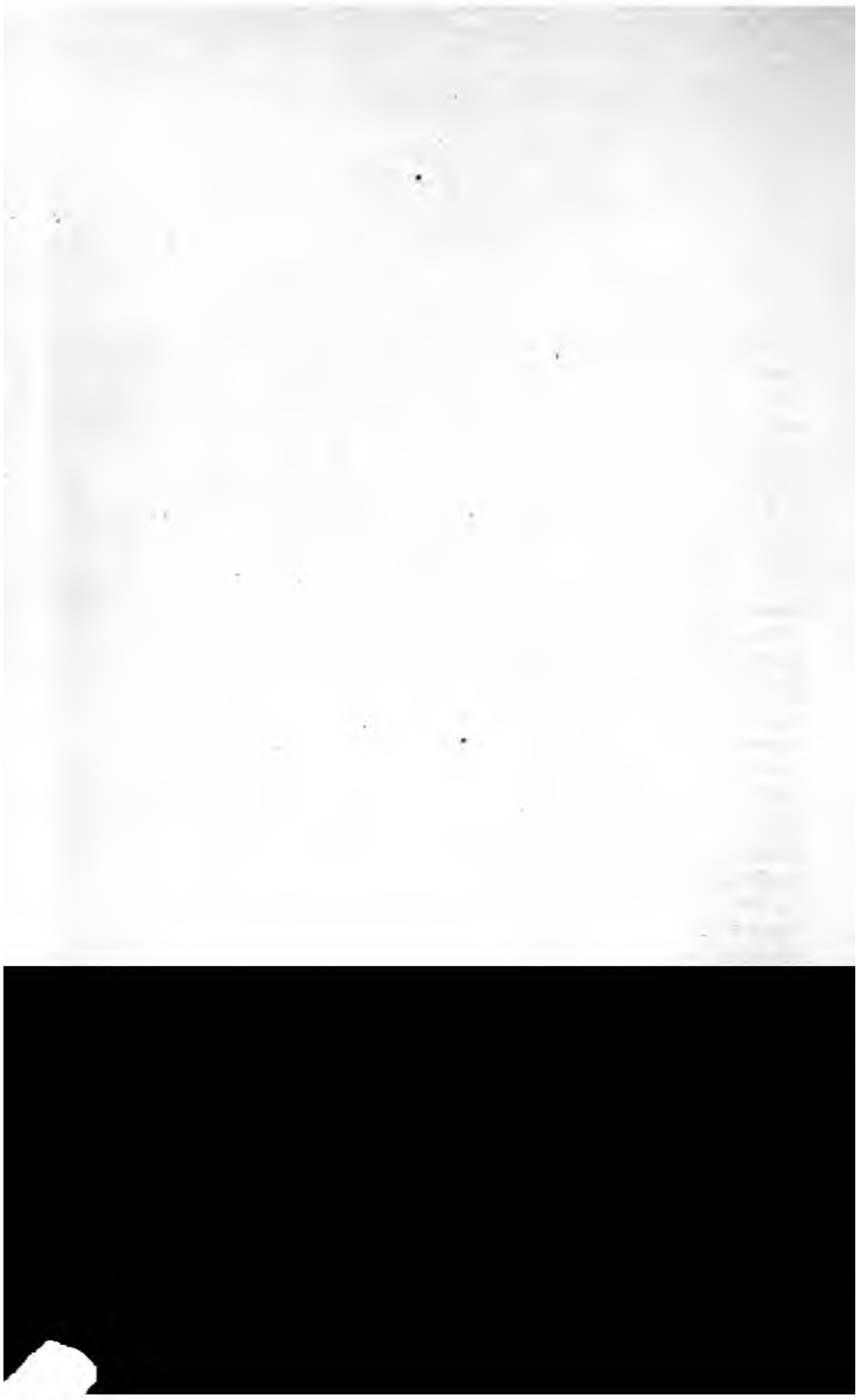


INTRODUCTION.

This work is intended to assist students of the Mollusca in the United States, by bringing together for their use a large number of excellent figures of species belonging to or illustrating the fauna of the southern and southeastern coasts of the United States, from Cape Hatteras south to the Straits of Florida and west to Mexico, with the adjacent waters.

These figures are explained and connected by a catalogue of the mollusks known to inhabit that region, either from the presence of authenticated specimens in the National Museum or on the authority of reputable naturalists who have collected in the region and whose specimens have been seen or reliably identified.

This catalogue, arranged for convenience in tabular form, includes not only the species which are illustrated on the plates but all other species common to the region, as far as known.

Hitherto there has been no catalogue which covered just this ground. There are several catalogues of marine species of particular West Indian islands. There are several lists of Floridian shells, the fullest and best being that just completed in the Proceedings of the Davenport Academy of Sciences by Mr. Charles T. Simpson. These all refer, however, to a much more restricted field than the present list, and the nomenclature in some cases is more or less inaccurate, as of course must be the case with all lists, each of which, in spite of its inevitable imperfections, should show some advance over its predecessors. This is all that the writer would claim for the present catalogue, which, owing to peculiar circumstances, has been rather hurriedly decided upon and rapidly prepared.

In order that the number of columns in the table should be compressed within the space of two opposite pages and yet admit of the use of brevier type, it has been necessary to limit the number of stations in the geographical series so that each column should represent a stretch of coast and seaward from it the archibenthal area or continental slope beyond the fifty-fathom line to the oceanic floor. Then various puzzling questions arose in attempting to decide which column should be used in certain cases; as, for instance, in specimens dredged in the path of the Gulf Stream between Cuba and the Florida Keys. They might with equal propriety be assigned to the "Florida Keys" or to the "West Indies" column, or to both. In all cases the facts have been

closely adhered to, as in leaving blank the "Georgia" column when specimens had been collected only in South Carolina and East Florida, with no data for the intermediate stretch of coast. This will show the real gaps in our knowledge of the distribution, and it is to be hoped will stimulate local students to fill them up.

The extreme northern and extreme southern range are generally given. When a species has been obtained off shore, and at one locality only, the extreme is usually noted in one column only, with a leaning toward the northern column when the species is supposed to be a southern form and to the southern column when it is thought to extend from the colder area. These assignments must often be conjectural, but when clearly understood they should not be in any way misleading.

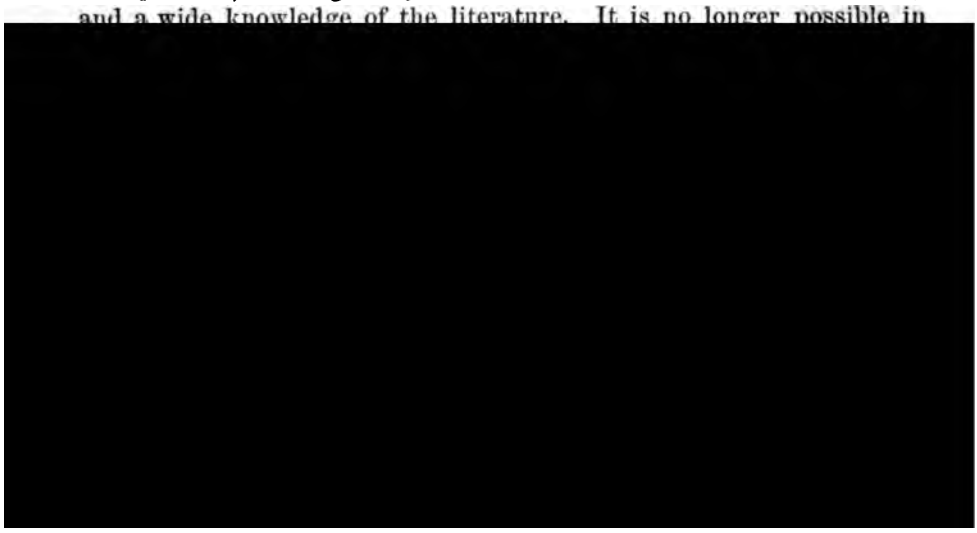
There are many unidentified species from this region in the National collection, a large proportion of which may prove to be new. In such cases the insertion of their distribution, as far as known, may lead to fuller investigation by collectors, though no specific name can be applied to them in the catalogue.

When a species whose name appears in one of the cited publications is not found in this catalogue, or is not cited from the locality to which the published authority refers it, the reader may infer that either the prior identification is here regarded as inaccurate, or, more generally, that the prior name is not entitled to be used.

In many cases the full explanation for such changes will be found in the Report on the Blake Mollusca, but in the present catalogue it has been quite impracticable, as well as undesirable, to attempt any synonymy.

The writer has attempted to steer a middle course between overdivision of large natural groups and the conservatism which confounds unlike things together. It is not to be expected that his decisions will be universally acceptable or satisfactory, since there are "many men, many minds" in biology as well as worldly affairs.

In practice, to be a good systematic malacologist requires much study and a wide knowledge of the literature. It is no longer possible in



great extent omitted. This list approximately represents our present knowledge, both in its acquirements and its defects, and is intended as a help toward something better and not in any sense as a finality in nomenclature or distribution.

We may now proceed to an explanation of the form and scope of the Tables.

Taking the columns serially, the first carries a serial number useful for check-list and exchange purposes. Then follows the name and authority. Then comes a column referring to the number of the plate or plates, and another for the numbers of the figures. As the figures on most of the plates are drawn to very different scales, a column is inserted, giving the maximum length, axial in Gastropods, antero-posterior in Pelecypods, of the specimen in millimeters. One millimeter is practically one twenty-fifth, or four one-hundredths, of an inch, so that for those unaccustomed to the metric system there is little difficulty in reducing the millimeters to fractions of an inch.

When no dimension is given in the column it will be understood that the figure, if any, is of the size of nature; or that its magnification or diminution is stated on the plate itself, or represented there by a line or other conventional sign.

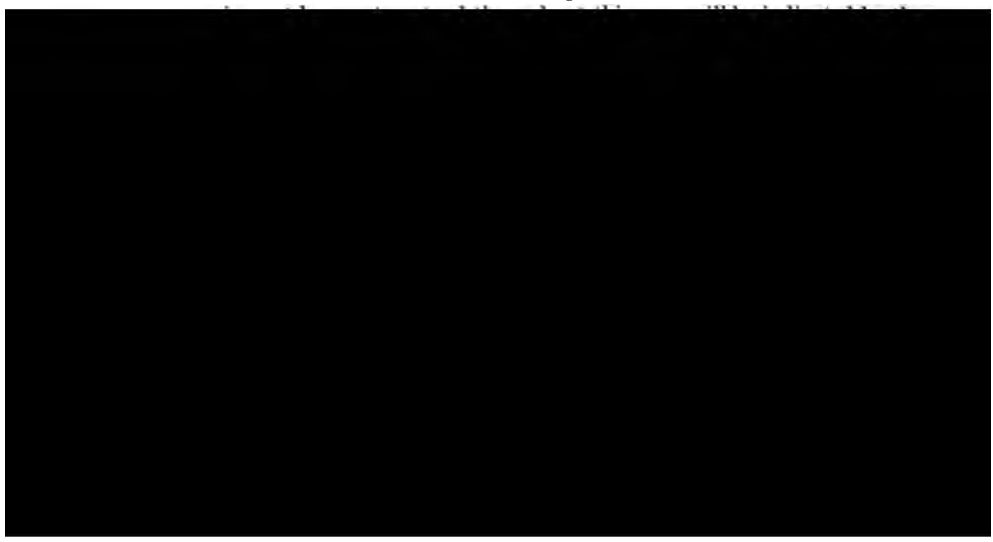
The next column states the range in depth as far as known of each species in the form of a fraction, the least depth forming the numerator and the greatest observed depth the denominator. Where a zero occurs it indicates that the species is found at low-water mark. The maximum and minimum are selected from the whole range, domestic or exotic, recorded for the species in question. When no depth is stated it will be understood that the species is supposed to inhabit the shallow water near shore or between tides.

This is succeeded by a column in which the extreme northern limit, locality, or region of the species referred to is recorded. When this relates to a locality within our special region there will seem sometimes to be a discrepancy; as, for instance, when a species appears as present in the "Hatteras" column, while in the "northern extreme" column Charleston, S. C., will be found. But, as will be immediately shown, Hatteras in the heading of the column does not mean a locality but a district, extending from Savannah, Georgia, to Cape Hatteras, North Carolina, so that the discrepancy is only apparent. In the off-shore dredgings it has been practicable sometimes to give only the latitude, or a general term such as "Arctic seas," to indicate the northernmost distribution of a species, since there has been no adjacent landmark to cite for northern limit. When a species has its northern limit on the rich archibenthal grounds off Block Island and the Vineyard, or Nantucket, I have indicated this by "Rhode Island" in the column, since this sufficiently guides foreign students who might be puzzled by the other names so much less apt to be found on small-scale maps of our eastern coast. The data for such species will be found chiefly in the

papers on material gathered by the U. S. Fish Commission, contributed by Prof. A. E. Verrill to the Transactions of the Connecticut Academy of Sciences, to the American Journal of Science, and to the Reports of the U. S. Fish Commissioner for 1871–'72 and 1883.

Then follow ten columns, each representing a district, as follows:

1. *New Jersey* (N. J.). This includes the coast and adjoining archibenthal area from the entrance of Chesapeake Bay to Sandy Hook at the south point of entrance to New York Bay and Harbor.
2. *Virginia* (Va.). This includes the coast, etc., from Cape Hatteras, North Carolina, to the mouth of Chesapeake Bay.
3. *Hatteras* (Hat.). This district extends from the mouth of the Savannah River, Georgia, to Cape Hatteras, North Carolina, with the adjacent archibenthal area.
4. *Georgia* (Ga.). At Cape Canaveral, Florida, the path of the Gulf Stream seems to diverge more from the main coast than previously. It seems that a good many southern species do not reach farther north on the shores than Cape Canaveral. Therefore this district from Cape Canaveral to the Savannah River has been separated from the one that I have called East Florida.
5. *East Florida* (East Fla.). This includes the region between Biscayne Bay and Cape Canaveral.
6. *Florida Keys* (Fla. Keys). This region, very intimately connected, faunally, with the northern shores of Cuba opposite, and with the Bahamas, includes the region south of Biscayne Bay on the east, and south of the southern entrance to Charlotte Harbor on the west side of the Peninsula, to and including the Keys and Tortugas reefs and islands.
7. *West Florida* (West Fla.). This includes the region north of the south entrance to Charlotte Harbor and westward to the Mississippi delta along the shore and the archibenthal area of the Gulf of Mexico westward from the peninsula to west longitude 90°, and southward to the trough between Cuba and Florida.
8. *Texas* (Tex.). In this district I include the shores of the United States from the Mississippi delta to the Rio Grande and the archibenthal area southward from it in the Gulf of Mexico to Yucatan.
9. *West Indies* (West Ind.). In this district, for want of space on the page, I have been obliged to include all of the Antilles, the Bahamas, and the shores and islands of the Caribbean Sea. The particular southern extension of a



Mexico, or California. These forms are very interesting, as most of the species originally common to both have developed special modifications since the separation of the two oceans, so as to be entitled to separate specific names.

A column (West. Am.) is devoted to recording those found on both sides of the continent yet which still remain essentially unchanged, and another (Eur.) to those whose range extends to European shores.

Another column is devoted to the southern extreme limit (as far as known) of the species enumerated in the catalogue, corresponding on the south to the column for northern limit on the north. Many Antillean species extend on the Brazilian coast far south of Cape San Roque, but our records for this region are very imperfect, and many of the items in this column are due to the data obtained by the U. S. Fish Commission steamer *Albatross* on her voyage from the Chesapeake Bay around to California via the Straits of Magellan only a year ago.

A column records the oldest known appearance of a species in geological time. This column is very imperfect and inadequate to express the real state of the case, since many of our recent species have been described from our southern tertiaries under other names, and the duplication thus occasioned, except in a comparatively small number of species, still remains to be worked out. It was thought well, however, to make a beginning in the matter in this instance.

This completes our description of the table, which will enable any one to use the latter intelligently and without misconception.

In making entries in the columns showing distribution an asterisk shows that the species is known from that region from the shores, either picked up on the beach or found living between high water and fifty fathoms, or that the depth it inhabits is not known but is supposed to be small. In cases where the species is recorded from the archibenthal area only, say 50 to 800 fathoms, its presence is indicated by a dagger point in the column. When both an asterisk and a dagger point are found in a single column the species is supposed to occur, or is recorded as obtained, both in shallow and in deep water, within the limits of that region or district. Many southern species, found in the cool water of the deeps in the south, approach the surface in the cooler surface waters of their northern range. *Vice versa*, we find northern littoral species seeking the deeps as they approach the limits of their southern range. A glance at the columns frequently will illustrate these facts.

The data from which the tables which form the bulk of this publication have been compiled are chiefly comprised in the collections of the U. S. National Museum, the Museum of Comparative Zoology in Cambridge, Mass., and the publications of the writer on these collections. The works in which detailed information has been chiefly sought are specified on another page, but the most important for this purpose has been the Report on the Blake Brachiopoda, Pelecypoda,

Gastropoda, and Scaphopoda, published in two parts by the Museum of Comparative Zoology, under the direction of Prof. Alexander Agassiz. The generosity of Professor Agassiz in permitting the use of plates prepared for that report was decisive in insuring the preparation of this list. Other plates are made up of figures which have appeared in the annual reports of the U. S. Commissioner of Fish and Fisheries; in the Proceedings of the National Museum; the edition of Gould's Invertebrata of Massachusetts, edited by Mr. W. G. Binney; Professor Verrill's and Miss Bush's papers in the Transactions of the Connecticut Academy of Sciences; and the publications of the British Museum. For the use of these cuts we are indebted chiefly to the Smithsonian Institution and the U. S. Commissioner of Fisheries, Col. Marshall Macdonald.

In including or omitting groups of mollusks in this catalogue the compiler has necessarily been guided by convenience rather than systematic completeness. Some groups, such as the Nudibranchiata, are so imperfectly known from the region south of New England that it becomes imperative that they should be entirely omitted. An attempt to include them would certainly have been more likely to retard than to advance the progress of science. For the same reason partly, and partly because it is impracticable to reproduce the figures, the entire group of Cephalopoda, except the Argonaut and Spirula, has been left out. Those who desire to study these difficult animals are referred to Professor Verrill's excellent reports upon the subject in the Bulletin of the Museum of Comparative Zoology and the Transactions of the Connecticut Academy of Sciences. The two exceptions are included merely because of one we have an excellent figure, and the shell of the other is frequently obtained by collectors on our southern shores.

Among those animals which frequent the sea-shore and are often found in as well as near the water, though really air-breathers, the *Auriculidæ*, *Siphonariidæ*, and *Gadiniidæ* can almost be regarded as marine. Having good figures of some of them and desiring to err, if at all, on the side of convenience to the amateur collector or beginner in conchology, they have been included in our list. For the same reason *Neritina*, *Cyrena*, etc., have been inserted even when not strictly salt-water species.

The Pteropods, of the sea off our coasts, are rarely found by collectors, and the nomenclature is not in a satisfactory state. Still it was thought best to include a list of the species taken, with some additions, chiefly from Professor Verrill's papers, though completeness or entire accuracy is not claimed for it. The Heteropods, except *Atlanta Carinaria* and *Oxygyrus*, are not included.

It will be seen from these explanations that the present catalogue is a working list for the benefit of collectors and students, rather than a scientific treatise or thoroughly revised enumeration of the mollusk fauna. Indeed it is in its quality of a stepping-stone to the latter that

such value as it may possess inheres. Experience has shown that check-lists, however imperfect in themselves, are extremely useful in stimulating faunal research, and it is in the hope that this result will be secured that the compiler finds his chief return for the labor and time expended upon a confessedly imperfect production.

Having been for some time engaged in a revision of the general system for the classification of Pelecypods, which will shortly appear in print, the revised classification has been used in the List of Pelecypoda, Table II, as far as it is applicable thereto.

The writer is under particular obligations to Prof. Alexander Agassiz, as already stated, and also to Professor Verrill and Miss Bush for the use of drawings and for an unpublished list of shallow-water mollusks obtained near Cape Hatteras, which has added to our list several species and confirmed several others about which I had felt some doubt. The different sources of the figures will be found acknowledged under the "Explanation of the Plates" in each case.

In conclusion, the writer expresses his obligation to the gentlemen whose writings have been laid under contribution; to all who have facilitated his endeavors to form a representative collection of this mollusk fauna, for the use of students in the National collection; and to Dr. R. E. C. Stearns, of the U. S. Geological Survey, for invaluable personal assistance. The compiler solicits correspondence from all interested, toward the improvement of this catalogue and especially series of the local shells from any point on the coast which may shed light on the geographical distribution of the species. Such correspondence or material may be addressed to the Curator of the Department of Mollusks at the U. S. National Museum, Washington, D. C., or in care of the Smithsonian Institution.

WASHINGTON, *May* 15, 1889.

LIST OF WORKS REFERRED TO FOR THE GEOLOGICAL OR GEOGRAPHICAL DISTRIBUTION OF SPECIES CITED IN THIS CATALOGUE, OR CONTAINING ENUMERATIONS OF LOCAL FAUNÆ INCLUDED IN THE GENERAL REGION TO WHICH THIS CATALOGUE RELATES.

Adams (Charles Baker). Specierum novarum conchyliorum in Jamaica repertorum synopsis.

In Boston Society of Natural History; Proceedings. Boston, the society, 1845. Vol. II, pp. 1–17, Jan., 1845. 8°.

——— Contributions to conchology. New York, H. Baillière, Oct. 1849–Nov. 1852.

Vol. I, iv, 258 pp. 8°. This was published in short, carefully dated parts, the dates of which it seems unnecessary to cite.

——— Monograph of Vitrinella, a new genus of new species of Turbinidæ. Amhert, Mass., the author, Feb., 1850.

10 pp. 8°.

American Journal of Conchology, edited by George W. Tryon, jr. Philadelphia, G. W. Tryon, jr. 1865–1866.

2 vols. 8°. Also:

——— The same. Philadelphia, Conchological Section of the Academy of Natural Sciences, 1867–1872.

5 vols. 8°.

Arango y Molina (Rafael). Contribucion á la fauna malacológica Cubana. Habana, G. Montiel y Comp., 1878.

Pp. 280, 35. 8°. This work was first printed in the Anales de la Real Academia de Ciencias Médicas, Físicas y Naturales de la Habana, beginning in March, 1878; to signature 3, May 15, 1878; to signature 12, January 15, 1879; to signature 14, February 15, 1879; to signature 15, April 15, 1879; to signature 17, June 15, 1879; and the remainder July 15, 1880, with a separately paged index.

[redacted]

Boston Journal of Natural History, containing papers and communications read to the Boston Society of Natural History, 1834[–]1863, published by their direction. Boston [various publishers], for the society, 1834–1863.

7 vols. 8°.

Bush (Katherine J.). Additions to the shallow-water mollusca of Cape Hatteras, N. C., dredged by the U. S. Fish Commission steamer *Albatross* in 1883 and 1884.

In Transactions Connecticut Academy of Sciences, New Haven, Conn., vol. VI, pp. 453–480, pl. xlv. June, 1885.

——— List of deep-water Mollusca dredged by the U. S. Fish Commission steamer *Fish Hawk* in 1880, 1881, and 1882, with their range in depth.

In Annual Report U. S. Commissioner of Fisheries for 1883. Washington, Government Printing Office, 1885. 8°. Pp. 701–727.

Calkins (William W.). Marine shells of Florida.

Ext. Davenport Academy of Natural Sciences; Proceedings. Davenport, Iowa, the society, 1878. Vol. II, pp. 232–252, pl. viii. 8°. Extract, with bastard title repeated on cover; pagination of original preserved. Slips with addenda were issued by the author on several occasions. This catalogue is partly a compilation. The new or specially interesting species are quoted by Dall (Hemphill's Shells, *q. v.*).

Conchologist's Exchange (The). Edited by William D. Averell. Philadelphia, the editor, 1886–1888.

Vol. I, No. 1, was printed on a postal-card, July, 1886. Nos. 2 to 12, and vol. II, Nos. 1 to 8, were issued in small quarto, the printed form 4½ by 6 inches, in two columns. The last number was dated "March and April, 1888," and appeared about April 30. This publication then suspended and was succeeded by the "NAUTILUS" (*q. v.*) in May, 1889.

Conrad (Timothy Abbott). Fossil shells of the Tertiary formations of North America. Illustrated by figures drawn on stone from nature. Vol. 1. Philadelphia, 1832. 8°. Plates.

[First edition.] Part I, pp. 1–20, pl. 1–6, Oct. 1, 1832.

Part II, pp. 21–28, pl. 7–14, Dec., 1832. A note by the author on the fourth page of the cover.

Part III, pp. 29–38, Aug., 1833. There is a note on the cover about the plates, but none were issued with this part.

Part IV, pp. 39–46, Oct., 1833. On the fourth page of cover there is a note dated November 1, 1833.

[Second edition.] Pp. 29–56, pl. 15–18; a colored map of Alabama, title-page, March 1, 1835. This was issued with Parts I and II of the first edition.

——— Fossils of the Tertiary formations of the United States. Illustrated by figures drawn from nature. Philadelphia, J. Dobson, 108 Chestnut street. E. G. Dorsey, printer, 1838. 8°. Plates.

Part I. Introduction, pp. v–xvi; text, pp. 1–32; pl. 1–17. Jan., 1838. The fourth page of cover has descriptions of four species upon it.

Part II, pp. 33–56, pl. 18–29, May 7, 1840. Three pages of the cover have descriptions of species printed upon them, including the four descriptions from the cover of Part I.

Part III, pp. 57–89, pl. 30–49, Jan., 1845. Nothing but the title printed on cover.

Conrad (Timothy Abbott)—Continued.

This work is often quoted as "Conrad's Fossils of the Medial Tertiary." The dates are determined by manuscript notes of the author, for details in regard to which I am indebted to a note in the American Naturalist for July, 1888, by Dr. Otto Meyer.

——— Descriptions of new species of fossil and recent shells and corals.

In Academy of Natural Sciences of Philadelphia; Proceedings, vol. III, pp. 23–27, pl. 1–2, Feb., 1846.

——— Descriptions of two new genera and new species of recent shells, etc.

In Academy of Natural Sciences of Philadelphia; Proceedings, vol. IV, p. 121, Dec., 1848.

——— Synopsis of the genus Cassidula Humphrey and of a proposed new genus, Athleta.

In Academy of Natural Sciences of Philadelphia; Proceedings, vol. VI, pp. 448–449, Dec., 1853.

——— Notes on shells, with descriptions of three recent and one fossil species.

In Academy of Natural Sciences of Philadelphia; Proceedings, vol. VII, pp. 31–23, March, 1854.

——— Description of a new genus of the family Dreissenidæ.

In Academy of Natural Sciences of Philadelphia; Proceedings, new series, 1857, p. 167.

——— Descriptions of new fossil and recent shells of the United States.

In Journal of the Academy of Natural Sciences of Philadelphia, new series, vol. I, Part III, pp. 207–209, 280, pl. xxxix.

——— Observations on the geology of a part of East Florida, with a catalogue of recent shells of the coast.

In American Journal of Science. New Haven, B. Silliman and J. D. Dana, 1846. New series, vol. II, pp. 36–45, 393–398, 1846.

Coues (Elliott, M. D.). Notes on the Natural History of Fort Macon, N. C., and Vicinity.

In Academy of Natural Sciences of Philadelphia; Proceedings of 1871, pp.

Dall (William Healey). On certain Limpets and Chitons from the deep waters off the eastern coast of the United States.

In U. S. National Museum; Proceedings. Washington, the Museum, April 24, 1882. Vol. v, pp. 400–414. 8°.

——— On a collection of shells sent from Florida by Mr. Henry Hemphill.

In U. S. National Museum; Proceedings. Washington, the Museum, Dec., 1883. Vol. vi, pp. 318–342, pl. x. 8°. The new or specially interesting species signalized by Calkins and Melvill (*q. v.*) are enumerated in this article, besides those sent by Hemphill.

——— Notes on some Floridian land and fresh-water shells, with a revision of the Auriculacea of the eastern United States.

In the same. Vol. viii, pp. 255–289, pl. xvii, xviii, July, 1885.

——— Bulletin of the U. S. Geological Survey, No. 24. List of the marine mollusca, comprising the Quaternary fossils and recent forms from American localities between Cape Hatteras and Cape Roque, including the Bermudas.

Washington, Government Printing Office, 1885. 336 pp. 8°. This publication is essentially an index to the literature relating to the region specified, without synonymy, alphabetically arranged, and accompanied by a short bibliography of the literature referred to, and indications of the geographical range of the species cited.

——— Bulletin of the Museum of Comparative Zoology, at Harvard College. Vol. xii, No. 6. Reports on the results of dredging, under the supervision of Alexander Agassiz, in the Gulf of Mexico (1877–'78), and in the Caribbean Sea (1879–'80), by the U. S. Coast Survey steamer *Blake*, Lieutenant-Commander C. D. Sigsbee, U. S. N., and Commander J. R. Bartlett, U. S. N., commanding. xxix. Report on the Mollusca by W. H. Dall. Part I. Brachiopoda and Pelecypoda.

Cambridge, the Museum, Sept., 1886. Pp. 171–318, plates i–ix. 8°.

——— Bulletin of the Museum of Comparative Zoology, at Harvard College. Vol. xviii. Reports on the results of dredging, [etc.]. xxix. Report on the mollusca, by W. H. Dall. Part II. Gastropoda and Scaphopoda. Cambridge, the Museum, June, 1889.

492 pp., plates x–xl. 8°.

——— Contributions to the Tertiary fauna of Florida, with especial reference to the Miocene silex beds of Tampa and the Pliocene beds of the Caloosahatchie River.

In Transactions of the Wagner Free Institute of Science of Philadelphia, 1889. Folio, with plates. [In press.]

——— Report on the Mollusca collected by the U. S. Fish Commission steamer *Albatross* on her voyage from Chesapeake Bay, Virginia, by way of Magellan Strait to San Francisco, Cal., in 1887–'88. With illustrations.

[In preparation.]

D'Orbigny (Alcide Dessalines). Histoire physique, politique et naturelle de l'île de Cuba. Par M. Ramon de la Sagra [etc.]. Mollusques. Paris, Bertrand, 1853.

2 vols. 8°. Vol. I, 2 l. unp., 264 pp.; vol. II, 2 l. unp., 380 pp. Atlas folio, 1 l., xxix pl., n. d. [1842]. This publication, forming one of Sagra's series, but independently issued in the French language, appeared irregularly as follows: Vol. I, signatures 1–14 in 1841, signatures 15–17 and atlas in 1842; vol. II, signatures 1–7 in 1842, signatures 8–24 in 1847–1853. The two volumes were issued as a whole in 1853, with the latter date on the title-page. There is an edition in Spanish, conformable with the rest of the Spanish series of the work, which the compiler has not been able to consult, but which seems to have a widely different pagination, though the plates are the same.

Dunker (Dr. Wilhelm). Novitates conchologicæ. Mollusca marina. Beschreibung und abbildung neuer oder wenig gekannter meeres conchylien. Cassel, Theo. Fischer, 1858–1870.

144 pp. 4°. 45 pl.

Folin (Léopold, Marquis de). On the mollusca of H. M. S. *Challenger* expedition. The Cæcidæ, comprising the genera Parastrophia, Watsonia, and Cæcum. With a prefatory note by the Rev. Robert Boog Watson, B. A., F. R. S. E., F. L. S., etc.

Ext. Zool. Soc. London; Proceedings for 1879, with bastard title. London, the Society, 1880. Pp. 806–812. 8°.

——— Report on the Cæcidæ collected by H. M. S. *Challenger* during the years 1873–1876.

In "*Challenger* Reports," vol. XV, pp. 681–689, 1886. This is Appendix B to Watson's Report on the Gastropoda of the *Challenger* expedition, *q. v.*

Gould (Dr. Augustus Addison). Descriptions of new genera and species of shells.

In Boston Society of Natural History; Proceedings. Boston, the Society, 1862. Vol. VIII, pp. 280–284. 8°.

——— Otia conchologica. Boston, Gould & Lincoln, 1862.

256 pp. 8°.

——— Report on the invertebrata of Massachusetts, published agreeably to an order of the legislature. Second edition, comprising the

Guppy (R. J. Lechmere). On the West Indian Tertiary fossils.

In Geological Magazine, decade II, vol. I, Nos. 9 and 10, Sept. and Oct., 1874, pp. 433–454, pl. xvi–xviii. Also a supplement of one page, from the same, Jan., 1875. Extras repaginated and issued with the plates and supplementary leaf, with title "West Indian Tertiary fossils" on cover. Total pp. 22. 8°. London, Trübner, 1874.

Haddon (Prof. Alfred C.). Voyage of H. M. S. *Challenger*. Zoology. Report on the Polyplacophora collected by H. M. S. *Challenger* during the years 1873–1876.

In "*Challenger* Reports," vol. xv, Part XLIII, pp. 1–50, plates i–iii. London, 1886. 4°.

Heilprin (Prof. Angelo). Explorations on the west coast of Florida and in the Okeechobee Wilderness.

In Transactions of the Wagner Free Institute of Science of Philadelphia, vol. I, No. 1, pp. 1–134. May, 1887. Sm. folio, with plates I–19.

This contains the descriptions of many new species of Tertiary fossils from West Florida, besides other matters of interest.

Higgins (Rev. Henry H.) and **Marratt** (Frederick P.). Free public library, museum, and gallery of art of the borough of Liverpool. Museum report No. 1. Mollusca of the Argo expedition to the West Indies, 1876. Liverpool, D. M[illegible] & Co. 1876.

20 pp. 8°. 1 pl. A[illegible] mollusca in the West In[illegible]

Holmes (Prof. Francis S.). P[illegible] Charleston, S. C., R[illegible]

vi, 122 pp., xxv[illegible] published in 1[illegible] parts [illegible] brates. The remainder [illegible] Leidy, and partly [illegible] the volume are the unpaginated [illegible] pages.

Jahrbücher der deutschen mala[illegible] von Dr. W. K[illegible]

[illegible]

—— The same. [illegible]

[illegible]

—— The same. [illegible]

[illegible]

Jones (J. Matthew) [illegible] the Bermudas. [illegible]

[illegible]

Journal de Conchyliologie [illegible]

[illegible]

Journal de Conchyliologie. [illegible] Bernardi. Paris. [illegible]

[illegible]

Journal de Conchyliologie. Publié sous la direction de MM. Crosse et Fischer. Paris, Crosse, 1861–1888.

[Third series], 28 vols. 8°. Also:

——— Index général et systématique des matières contenues dans les vingt premiers volumes du Journal de Conchyliologie [etc.], 1850–1872. Paris, H. Crosse, 1878.

1 vol., viii, 200 pp. 8°.

[**Krebs** (Henry).] The West Indian marine shells, with some remarks. A manuscript printed for circulation between collectors. By * * *. [Kjöbenhavn.] Printed by W. Laubs' widow and Chr. Jörgensen, Nykjöbing, Falster, 1864.

3 prel. l. unp., 137 pp. 12°. The following mention of the circumstances attending the printing of this extremely rare, anonymously issued, yet scientifically valuable pamphlet occurs in a letter from the author, dated Dec. 1, 1884: "I beg to inform you that the [above pamphlet] was only printed in 20 copies, of which 3 were, according to law, delivered to the public libraries [of Copenhagen], 7 were lost in transmitting them to St. Thomas, 3 went to the universities of Sweden and Norway, and a few [were] given to friends." "Consequently there are none for sale. My friends tease me that the book is the costliest they know, on account of a copy has been sold in Altona, at auction, for 10 Rd." A copy presented by the author to Mr. Thomas Bland, and given by that gentleman to Mr. John H. Redfield, has, with great liberality, been presented by the latter to the library of the U. S. National Museum.

——— Remarks on some species of West Indian marine shells in the museum of Amherst College.

In Lyceum of Natural History of New York; Annals. New York, the society, 1866. Vol. VIII, 1866, pp. 394–398. 8°.

——— Catalogue of marine mollusks collected in the Bahama Islands in November, 1866.

In Lyceum of Natural History of New York; Annals. New York, the society, 1866. Vol. VIII, 1866, pp. 427–431. 8°.

Kurtz (Lieut. John D.). Catalogue of recent marine shells found on the coasts of North and South Carolina. Portland, David Tucker, 1860.

9 pp. 8°. See also STIMPSON and KURTZ.

Magasin de zoologie, d'anatomie comparée et de paléontologie—Cont'd. Mollusques et zoophytes. Années 1839 à 1844. Paris, veuve Bertrand, 1844.

2 vols. [Texte] 250 l. unp. 8°. [Planches] IV pp., 150 pl. 8°. This publication seems to have been printed with leaves numbered only to correspond with the plates or with the separate articles, which were afterward divided up in sections, each class being bound and sold separately.

Malakozoologische Blätter. Als Fortsetzung der Zeitschrift für Malakozoologie. Herausgegeben von Karl Theodor Menke, in Pyrmont, und Dr. Louis Pfeiffer, in Cassel. Cassel, Theodor Fischer, 1854–1862.

8 vols. 8°. Also:

——— The same. Herausgegeben von Dr. Louis Pfeiffer, in Cassel. Cassel, Theodor Fischer, 1862–1872.

10 vols. 8°. Also:

——— The same. Herausgegeben von Dr. Louis Pfeiffer, in Cassel, und Dr. W. Kobelt, in Schwanheim. Cassel, Theodor Fischer, 1872–1874.

3 vols. 8°. Also:

——— The same. Herausgegeben von Dr. Louis Pfeiffer, in Cassel, Cassel, Theodor Fischer, 1875–1877.

3 vols. 8°. Also:

——— Dr. Ludwig Pfeiffer's malakozoologische Blätter für 1878. Fortgesetzt von S. Clessin. Cassel, Theodor Fischer, 1878.

1 vol. 8°. Also:

——— Malakozoologische Blätter. Als Fortsetzung der Zeitschrift für Malakozoologie. Herausgegeben von S. Clessin. Neue Folge, erster[–zehnter] Band. Cassel, Theodor Fischer, 1879–1888.

10 vols. 8°. The earlier volumes of this series carried the date of issue on each signature. Later volumes are without it, and there is no means of determining the date of issue, which often was not within the year to which the volume ostensibly refers.

Melvill (James Cosmo, A. M., F. L. S.). List of the mollusca obtained in South Carolina and Florida, principally in the island of Key West, 1871–1872.

In Journal of Conchology. Leeds, J. Taylor, 1881. Vol. III, Nos. 5, 6, pp. 155–173. 12°. This catalogue contains many erroneous identifications.

Mörch (Otto Andreas Lowson). Catalogue of the West India shells in the collection of Dr. C. M. Poulsen, Kastanievei 5, Copenhagen. Copenhagen, Bianco Luno, 1878.

16 pp. 8°.

Nachrichtsblatt der deutschen malakozoologischen Gesellschaft. Unter mitwirkung von D. F. Heynemann; redigirt von Dr. W. Kobelt. Frankfurt am Main, W. Kuchler, 1869.

1 vol. sm. 8°. Also:

——— The same. Frankfurt am Main, J. D. Sauerländer, 1870–1871.

2 vols. 8°. Also:

Nachrichtsblatt, etc.—Continued.

——— The same. Redigirt von Dr. W. Kobelt. Frankfurt am Main, J. D. Sauerländer, 1872.

1 vol. 8°. Also:

——— The same. Redigirt von Dr. W. Kobelt und D. F. Heynemann. Frankfurt am Main, Johannes Alt, 1873.

1 vol. 8°. Also:

——— The same. Redigirt von Dr. W. Kobelt. Frankfurt am Main, Johannes Alt, 1874–1877.

4 vols. 8°. Also:

——— The same. Frankfurt am Main, Alt & Neumann, 1878–1879.

2 vols. 8°. Also:

——— The same. Frankfurt am Main, Moritz Diesterweg, 1880–1888.

9 vols. 8°.

Nautilus (The). A journal devoted to the interests of conchologists. Established in 1886 as "The Conchologist's Exchange." Vol. III[I], No. 1, May, 1889. Philadelphia, published monthly by H. A. Pilsbry and W. D. Averell. 8°. 1889.

The first issue under the above title, cited above, comprises iv, 12 pp.

Norman (Rev. A. M.). Presidential address delivered at the annual meeting of the Tyneside Naturalists' Field Club, May 27, 1881, with appendices on the fauna of the abysses of the ocean. Newcastle-upon-Tyne, John Bell, 1883.

8°. 68 pp. Appendix C contains a list of all the animals at that time recorded as obtained from the North Atlantic Ocean at a greater depth than 1,000 fathoms.

Pelseneer (Paul, D. Sc.). The voyage of H. M. S. *Challenger*. Zoology. Report on the Pteropoda. Part I. The Gymnosomata.

In "*Challenger* Reports," vol. XIX, pp. 1–74, plates i–iii. London, 1887. 4°.

——— (The same.) Part II. The Thecosomata.

In the same, vol. XXII, pp. 1–132, plates i, ii. London, 1888. 4°.

——— (The same.) Part III. Anatomy.

In the same, vol. XXIII, pp. 1–97, plates i–v. London, 1888. 4°.

Pfeiffer (Dr. Louis.) Bericht über die ergebnisse meiner reise nach

Say (Thomas). The complete writings of Thomas Say on the conchology of the United States. Edited by W. G. Binney. New York, H. Baillière, 1858.

8°. vi, 252 pp., pl. i-lxxv.

A reprint of Say's scattered papers and descriptions.

Simpson (Charles Torrey). Contributions to the mollusca of Florida.

In Davenport (Iowa) Academy of Natural Sciences; Proceedings of, vol. v, pp. 45–72, 63*–72*. 8°. Pages 45–48 appeared Aug. 25, 1887; pages 49–56, Nov. 4, 1887; pages 57–72, Feb., 1889, and the remainder in March, 1889.

Smith (Edgar Albert, F. Z. S.). The voyage of H. M. S. *Challenger*. Zoology. Report on the Lamellibranchiata collected by H. M. S. *Challenger* during the years 1873–1876.

In "*Challenger* Reports," vol. XIII, pp. 1–341, plates i–ixxv. London, 1885. 4°.

Stearns (Robert Edwards Carter). Descriptions of new species of marine mollusks from the coast of Florida.

Ext. Boston Society of Natural History; Proceedings, vol. xv, pp. 21–24, Jan. 17, 1872. 8°. 4 pp.

——— On a new species of Pedipes from Tampa Bay, Florida.

Ext. Boston Society of Natural History; Proceedings, vol. XIII, pp. 108–109, 1869. 1 leaf. 8°. Headed "Conchological Memoranda, No. 4."

——— Descriptions of new marine shells from the west coast of Florida.

Ext. Academy of Natural Sciences of Philadelphia; Proceedings for 1873, pp. 344–347, 1873. 8°. 4 pp.

Stimpson (Dr. William). Descriptions of new shells.

In Boston Society of Natural History; Proceedings, vol. IV, pp. 112–114, 1851

——— and **Kurtz** (Lieut. John D.). Descriptions of new shells.

In Boston Society of Natural History; Proceedings, vol. IV, pp. 114–115, 1851.

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208 pp., 44 pl. 8°. Issued in six parts, Nov., 1873, to Nov., 1874.

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——— Second catalogue of mollusca, recently added to the fauna of the New England coast and the adjacent parts of the Atlantic, consisting mostly of deep-sea species, with notes on others previously recorded.

In the same; vol. VI, pp. 139–294, plates xxviii–xxxii. 8°. 1884. Separate copies were issued.

——— Third catalogue of mollusca, recently added to the fauna of the New England coast and the adjacent parts of the Atlantic, consisting mostly of deep-sea species, with notes on others previously recorded.

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Watson (Rev. Robert Boog)—Continued.

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X.—The Journal, vol. xv, No. 88, pp. 458–475; read June 16, 1881; published Nov. 3, 1882. No title.

XI.—The Journal, vol. xvi, No. 91, pp. 247–254; read Dec. 15, 1881; published March 8, 1883. No title.

XII.—The Journal, vol. xvi, No. 93, pp. 324–343; read Dec. 15, 1881; published June 12, 1882. This part has bastard title.

XIII.—The Journal, vol. xvi, No. 93, pp. 353–372; read March 16, 1881; published June 12, 1882. This part has bastard title.

XIV.—The Journal, vol. xvi, No. 93, pp. 372–392; read March 16, 1882; published June 12, 1882. This part has bastard title.

XV.—The Journal, vol. xvi, No. 96, pp. 594–611; read June 15, 1882; published March 10, 1883. This part has bastard title.

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XVII.—The Journal, vol. xvii, No. 99, pp. 112–130; read March 1, 1883; published July 31, 1883. This part has bastard title.

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XIX.—The Journal, vol. xvii, No. 101, pp. 319–340; read May 3, 1883; published Oct. 20, 1883.

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2 vols. 8°. Also:

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SKETCH OF GENERAL ARRANGEMENT.

A.—CLASS BRACHIOPODA.

I. Order Arthropomata.

II. Order Lyopomata.

B.—CLASS PELECYPODA.

I. Order Prionodesmacea.
- 1. Suborder Ostracea.
- 2. Suborder Anomiacea.
- 3. Suborder Pectinacea.
- 4. Suborder Mytilacea.
- [5. Suborder Naiadacea.
- 6. Suborder Trigoniacea].
- 7. Suborder Arcacea.
- 8. Suborder Nuculacea.
- 9. Suborder Solenomyacea.

II. Order Teleodesmacea.
- 1. Suborder Carditacea.
- 2. Suborder Leptonacea?

II. Order Teleodesmacea—Continued.
- 3. Suborder Lucinacea.
- 4. Suborder Chamacea.
- 5. Suborder Cardiacea.
- 6. Suborder Veneracea.
- 7. Suborder Tellinacea.
- 8. Suborder Mactracea.

III. Order Anomalodesmacea.
- 1. Suborder Anatinacea.
- 2. Suborder Myacea.
- 3. Suborder Solenacea?
- 4. Suborder Ensiphonacea.
- 5. Suborder Adesmacea.

C.—CLASS SCAPHOPODA

I. Order Solenoconchia.

D.—CLASS GASTROPODA.

aa. SUBCLASS ANISOPLEURA.

A. *Superorder Euthyneura.*

I. Order Pteropoda.
- 1. Suborder Thecosomata.
- 2. Suborder Gymnosomata.

II. Order Opisthobranchiata.
- 1. Suborder Tectibranchiata.

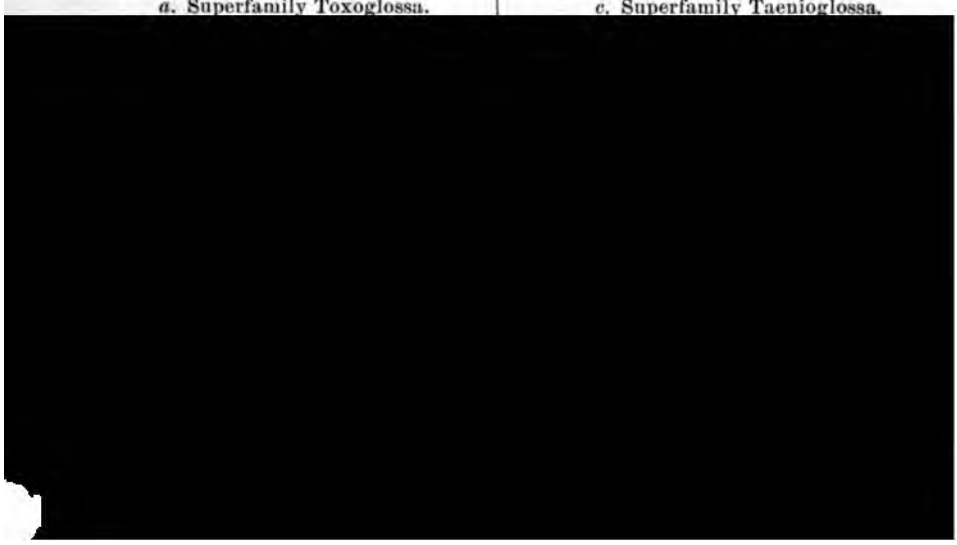
[III. Order Nudibranchiata.]

IV. Order Pulmonata.
- 1. Suborder Stylommatophora.
- 2. Suborder Basommatophora.

B. *Superorder Streptoneura.*

I. Order Ctenobranchiata.
- 1. Suborder Orthodonta.
  - *a.* Superfamily Toxoglossa.

I. Order Ctenobranchiata—Continued.
- 2. Suborder Streptodonta—Cont'd.
  - *c.* Superfamily Taenioglossa.



ABBREVIATIONS FOR LOCALITIES.

ERRATUM.

The arrangement sketched on page 26 and followed in the tables was made out before the completion of my studies of the classification of the Pelecypods. These being since completed, two changes would follow in the arrangement. The suborder *Solenacea* would be transferred to the order *Teleodesmacea*, following the *Tellinacea*, and the suborder *Solenomyacea* would be transferred to the *Anomalodesmacea*. It is also probable that the *Isocardiacea* should be raised to subordinal rank.

W. H. DALL.

AUGUST 19, 1889.

Char. H.	Charlotte Harbor, Fla.	St. Bart.	St. Bartholomew.
Charl.	Charleston, S. C.	S. Car.	South Carolina.
Chesap.	Chesapeake Bay.	St. Cruz.	St. Croix or Santa Cruz
C. Rom.	Cape Romano, Fla.	St. Dom.	Santo Domingo.
C. Sable.	Cape Sable, Nova Scotia.	St. J.	St. John.
Cub.	Cuba.	St. M.	Saint Martin.
Cul.	Culebra.	St. Thos.	St. Thomas.
Cur.	Curaçoa.	St. Vin.	St. Vincent.
Dom.	Dominica.	Tex.	Texas.
E. Fla.	East Florida.	Tort.	Tortola.
Eur.	Europe.	Trin.	Trinidad.
Fernand.	Fernandina, Fla.	V.	Viéque.
Fla.	Florida.	Va.	Virginia.
Ga.	Georgia.	V. Cruz.	Vera Cruz.
Gtm.	Guatemala.	VD.	Van Dyck's Island.
Guad.	Guadalupe.	Ven.	Venezuela.
Gulf, or G. Mex.	Gulf of Mexico.	Vg. I.	Virgin Islands.
Hatt.	Cape Hatteras.	W.	Water Island.
Hond.	Honduras.	W. Fla.	West Florida.
Hait.	Haiti.	Yuc.	Yucatan.
Jam.	Jamaica.	Z.	Zieeh.

TABLE I. A.—*List of Brachiopoda.*

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Class BRACHIOPODA.					
	Order ARTHROPOMATA Owen.					
	Family TEREBRATULIDÆ.					
	Genus TEREBRATULA Llhwyd.					
1	T. cubensis Pourtalès	39	6, 10	27	$\frac{80}{400}$	Fla. Reefs
2	T. Bartlettii Dall	6	4*a–c*	40	$\frac{70}{250}$	Gulf of Mex.
3	T. incerta Davidson	6	6, 6*a*	10.5	$\frac{189}{1850}$	Gulf of Mex.
	Genus TEREBRATULINA Orbigny.					
4	T. Cailleti Crosse	39	8, *yo.*	10	$\frac{30}{290}$	Fernandina
5	T. septentrionalis Couth	49	1, 2	22	$\frac{8}{83}$	Halifax
	Family EUDESIIDÆ.					
	Genus EUDESIA King.					
6	E. floridana Pourtalès	39	9, 11	23	$\frac{112}{310}$	Sand Key
7	E. cranium Müller	....	.....	.....	$\frac{30}{1360}$	Norway
	Genus MEGERLIA King.					
8	M. disparilis Dall	....	.....	2.6	$\frac{100}{110}$	.....
	Family MEGATHYRIDÆ.					
	Genus CISTELLA Gray.					
9	C. Barrettiana Davidson	....	.....	5	$\frac{80}{450}$	Fla. Keys
10	C. lutea Dall	....	.....	6.5	$\frac{30}{287}$	Hatteras
11	C. Schrammi C. and F	....	.....	.....	100	Gulf of Mex.
	Family PLATIDIIDÆ.					

BLE I. A.—*List of Bra*...—*Continu*...

East Fla.	Fla. Keys	West Fla.	Tex.	West Ind.	...	...	...	...	...ern ... range.	Range in time.
									Florida Keys	Pliocene.
									Barbados....	
									Martinique .	
									Charlotte H.	
									Martinique ..	
									Cape Fear...	
									Guadalupe ..	
									Barbados....	? Pliocene.
									Barbados....	
									Guadalupe ..	
									West Indies .	
									...lupe ..	
									...	Pliocene.

TABLE I. A.—*List of Brachiopoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth	Northern extreme range.
	Order LYOPOMATA Owen.					
	Family CRANIIDÆ.					
	Genus CRANIA Retzius.					
16	C. Pourtalesii Dall	....	.....	7	$\frac{fm}{116}$	Fernandina.
	Family DISCINIDÆ.					
	Genus DISCINA Lamarck.					
	Subgenus **Discinisca** Dall.					
17	D. atlantica King	....	.....	5	$\frac{600}{1050}$	Baffin's Bay.
18	D. antillarum Orbigny	....	.....	10	$\frac{18}{194}$	Fernandina.
	Family LINGULIDÆ.					
	Genus GLOTTIDIA Dall.					
19	G. antillarum Reeve	....	.....	6.2	$\frac{0}{16}$	Cuba
19*a*	var. pyramidata Stimpson	....	.....	.....	$\frac{0}{20}$	Chesap. Bay.

TABLE I. A.—*List of Brachiopoda*—Continued.

N. J.	Va.	Hat.	Ga	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern. extreme range.	Range in time.
----	---	----	†	†	†	-----	†	†	----	?	-----	St. Vincent..	
†	†	----	†	----	-----	-----	----	†	----	†	-----	Australia....	
----	---	----	†?	----	-----	-----	----	*	----	---	-----	Martinique..	
----	---	----	---		?	?	?	*	----	----	?	Martinique..	
----	*	*	*		*	*	?	?	----	----	-----	Florida	

TABLE II. B.—*List of Pelecypoda.*

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Class PELECYPODA.					
	Order PRIONODESMACEA.					
	Suborder OSTRACEA.					
	Family OSTREIDÆ.					
	Genus OSTREA Linné.					
1	O. virginica Gmelin	....	.....	.....	.....	P. E. Island..
2	O. frons Linné	....	.....	.....	.....	Jupiter Inlet
3	O. cristata Born	....	.....	.....	.....	Tampa.....
4	O. equestris Say	....	.....	.....	.....	N. Carolina..
	Suborder ANOMIACEA.					
	Family ANOMIIDÆ.					
	Genus ANOMIA Linné.					
5	A. simplex Orbigny	53	1, 2	.....	0 to 1/2	Cape Sable..
6	A. aculeata Linné	53	5–8	.....	0 to 80	Arctic Ocean
	Genus PLACUNANOMIA.					
7	P. rudis Broderip	....	.....	.....	.....	Cedar Keys..
	Suborder PECTINACEA.					
	Family DIMYIDÆ.					
	Genus DIMYA Rouault.					
8	D. argentea Dall	4	5*a–b*	10.5	73 to 248	Hatteras ....
	Family SPONDYLIDÆ.					
	Genus PLICATULA Lam.					

TABLE II. B.—*List of Pelecypoda.*

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Ber-mu-da.	Eur.	West Am.	Southern extr me range.	Range in time.
*	*	*	*	*	*	*	*	*	....	....	....	Florida Keys	Pliocene.
....	..	....	..	*	*	*	....	*	....	....	....	Barbados....	
....	.	....	..	....	*	*	..	*	....	....	....	Martinique .	
...	..	*	*	*	....	*	....	....	....	....	....	Charlotte H .	
*	*	*	*	*	*	*	*	*	*	....	....	Martinique ..	
*	*	*	..	....	....	....	....	....	....	*	....	Cape Fear...	
....	..	....	..	....	*	*	....	*	*	....	....	Guadalupe ..	
....	..	†	..	....	....	....	....	†	....	....	....	Barbados....	? Pliocene.
*	*	*	*	*	*	*	*	*	....	....	....	Barbados....	
....	..	....	..	*	*	*	*	*	*	....	....	Guadalupe ..	
....	..	....	..	....	....	....	†	†	....	†	....	West Indies .	
....	..	....	..	....	*	*	....	*	*	....	....	Guadalupe ..	
....	..	*	..	*	*†	*†	....	*	....	....	....	Florida Str..	Pliocene.

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Subgenus **Amusium** Schum.					
14	A. Mortoni Say	....	.....	100.0	30/50	Gulf of Mex.
15	A. Dalli Smith	4 40	1*a–b* 6	62.0	218/1691	Bermuda ....
	Section PROPEAMUSIUM Greg.					
16	A. Pourtalesianum Dall	5	12	.....	13/805	Cedar Keys..
17	var. *striatulum* Dall	....	.....	.....	138/424	Santa Cruz..
18	var. marmoratum Dall	4	3	12.0	13/805	.....
19	A. cancellatum Smith	5	1*a*, 2	26.0	13/191	Charlotte H.
20	A. Holmesii Dall	5	5, 11	12.0	100/273	Fernandina .
21	A. Sayanum Dall	5	3, 9	15.5	180/400	Florida Str..
	Subgenus **Pecten** s. s.					
22	P. magellanicus Gmelin	70	2	300.0	1/109	Labrador ....
23	P. irradians Lamarck	53	11	75.0	.....	Nova Scotia .
24	var. dislocatus Say	....	.....	40.0	.....	Hatteras ....
25	P. nucleus Born	....	.....	25.0	.....	Florida Keys
26	P. exasperatus Sowerby	....	.....	.....	.....	Hatteras ....
27	P. ornatus Lamarck	....	.....	.....	.....	Cedar Keys..
28	P. antillarum Recluz	....	.....	.....	.....	Key West ...
29	P. effluens Dall	42	9	26.0	85/300	Fernandina .
30	P. phrygium Dall	40	1	36.5	50/792	Hatteras ....
31	P. glyptus Verrill	....	.....	60.0	69/152	Rhode Island
32	P. imbricatus Gmelin	....	.....	.....	.....	Tortugas ....
33	P. nodosus Linné	....	.....	.....	.....	Hatteras ....
34	var. fragosus Conrad	....	.....	.....	.....	Cedar Keys..

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
----	--	----	--	----	----	*†	----	†	----	----	----	Haiti	Miocene.
----	--	----	--	----	----	†	----	†	†	----	----	Barbados....	
----	--	----	--	†	†	*†	----	†	----	----	----	Grenada.....	
----	--	----	--	----	----	----	----	†	----	----	----	St. Vincent..	
----	--	----	--	†	†	*†	----	†	----	----	----	Grenada	
----	--	----	--	----	†	*	----	†	†	----	----	St. Vincent..	
----	--	----	†	----	----	----	----	†	----	----	----	Barbados....	
----	--	----	--	----	†	----	----	†	----	----	----	Saba	
*	*	*	--	----	----	----	----	----	----	----	----	Hatteras	Miocene.
*	*	*	*	----	----	*	-	----	----	----	----	Tampa	Miocene.
----	--	*	*	*	*	*†	*	†	----	----	----	Florida Str..	
----	--	----	--	----	*	----	----	†*	----	----	----	Guadalupe ..	
----	--	*	--	*	*	*	----	*	----	----	----	Guadalupe ..	
----	--	----	-	*	*	----	----	*	----	----	----	Barbados....	
----	--	----	--	----	*	----	----	*†	----	----	----	Guadalupe ..	
----	--	----	†	----	†	----	----	†	----	----	----	Cuba.....	
----	--	†	--	----	†	†	----	†	----	----	----	Grenada	
†	--	†	--	----	----	----	----	----	----	----	----	Hatteras	
----	--	----	--	----	*	----	----	*	*	----	----	Trinidad	
----	--	*	--	*	*	*	----	*?	----	----	----	Florida Keys	Pliocene.
----	--	----	--	----	----	†	----	*	----	----	----	Guadalupe ..	
†	--	----	--	----	----	----	----	----	----	†	----	.....	
----	--	†	--	----	----	----	----	†	----	----	----	Barbados....	
----	--	*†	--	----	†	----	----	†	----	----	----	Barbados....	
----	--	†	--	----	----	----	----	----	----	----	----	Hatteras	
----	--	†	--	----	----	----	----	----	----	†	----	Hatteras	
†?	--	----	--	----	----	----	----	----	----	†	----	Rhode Island	
----	--	----	--	----	†	----	----	†	----	----	----	Cuba.....	
†?	--	----	--	----	----	†	----	----	----	†	?	Patagonia...	
----	--	----	†	----	----	†	----	†	----	†	----	Cuba.....	
†	--	----	--	----	----	----	----	----	----	----	----	N. lat. 37°...	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus HINNITES Defrance.					
45	*H. Adamsi* Dall	5	6	28.0	573	N. Atlantic..
	Family LIMIDÆ.					
	Genus LIMA Bruguière.					
46	L. squamosa Lamarck	....	.....	.....	.....	Sarasota ....
47	L. tenera Sowerby	....	.....	.....	.....	Cedar Keys..
48	L. scabra Born	....	.....	.....	.....	Hatteras ....
49	L. albicoma Dall	....	.....	8.0	$\frac{1}{121}$	Fla. Keys....
50	L. hians Gmelin	....	.....	.....	$\frac{1}{32}$	Florida Str..
51	L. inflata Lamarck	....	.....	.....	.....	Hatteras ....
	Subgenus **Limatula** S. Wood.					
52	L. setifera Dall	....	.....	5.75	$\frac{22}{250}$	Hatteras ....
53	L. subauriculata Montagu	....	.....	.....	$\frac{9}{113}$	Arctic Sea...
54	L. confusa Smith	....	.....	.....	$\frac{31}{1130}$	N. Atlantic..
55	L. laminifera Smith	....	.....	.....	$\frac{32}{152}$	Florida Str..
	Genus LIMÆA Bronn.					
56	L. Bronniana Dall	....	.....	3.1	$\frac{15}{100}$	Hatteras ....
57	var. lata Dall	....	.....	5.2	$\frac{224}{504}$	Fernandina .
	Suborder MYTILACEA.					
	Family AVICULIDÆ.					
	Genus AVICULA Lamarck.					
58	A. atlantica Lamarck	....	.....	.....	$\frac{10}{180}$	Hatteras ....
59	A. nitida Verrill	....	.....	.....	$\frac{88}{792}$	Rhode Island

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	....	....	....	†	....	††	....	St. Vincent..	
....	..	....	..	....	*	*	....	*†	*	*	....	Barbados....	
....	..	....	..	....	*	*	....	*	....	....	....	Barbados....	
....	..	*	..	....	*	....	....	*	....	....	....	Trinidad	Pliocene.
....	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	*	....	....	*	....	*	....	Santa Cruz..	
....	..	*	*	....	*	*	....	*	*	*	*	Trinidad	
....	..	†	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	*†	..	....	†	....	....	....	....	†*	....	Florida Str..	Pliocene.
....	..	*	..	†	....	†.	....	†	....	†	....	Brazil.....	
....	..	....	..	†	....	....	....	†	....	....	....	Sombrero ...	
....	..	*†	..	†	....	....	....	†	....	....	....	Barbados....	
....	..	....	†	....	†	....	....	†	....	....	....	Cuba.....	
....	..	*†	*	....	*†	*	*	*	....	....	....	Venezuela...	P. Pliocene.
†	..	....	..	....	*	*	....	....	....	†	....	Tortugas....	
....	..	....	*	*	*	*	....	*	*	....	....	Brazil.....	
....	..	....	..	*	*	*	*	*	*	....	....	Guadalupe ..	
....	..	....	..	*	*	....	....	*	*	....	....	Jamaica.....	
....	..	*	*	*	*	*	*	*	....	....	....	Venezuela...	Pliocene.
....	..	*	*	*	*	*	*	*	....	....	....	Guadalupe ..	
....	..	*	..	*	*	....	....	*	....	....	....	Barbados....	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family MYTILIDÆ.					
	Genus MYTILUS Linné.					
66	M. edulis Linné	71 54	2 3			Arctic Sea...
67	M. hamatus Say					Rhode Island
68	M. exustus Linné					Charleston ..
	Genus SEPTIFER Recluz.					
69	S. ——					Tampa Bay..
	Genus MODIOLA Lamarck.					
70	M. modiolus Linné	54	4		$\frac{0}{10}$	Arctic Sea...
71	M. tulipa Linné					N. Carolina..
	Section BRACHYDONTES Swainson.					
72	M. sulcata Lamarck					Tampa Bay..
73	M. plicatula Lamarck	54	1			Nova Scotia.
74	var. semicostata Conrad					St. Augustine
	Section AMYGDALUM Megerle.					
75	M. lignea Reeve					S. Carolina ..
76	M. polita Verrill & Smith	6 45	3 12	50. 0 33. 0	$\frac{1}{1000}$	N. Atlantic ..
77	var. sagittata Dall				$\frac{88}{196}$	Cedar Keys..
78	M. papyria Conrad					Jupiter Inlet
	Section BOTULINA Dall.					
79	M. opifex Say				$\frac{0}{12}$	Hatteras ....
	Section BOTULA Mörch.					

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
*	*	*	..	....	....	....	....	....	....	*	*	N. Carolina..	Pliocene.
*	*	*	*	....	*	*	*	....	....	....	....	Costa Rica ..	
....	..	*	..	*	*	*	*	*	*	....	....	Brazil.....	
....	..	....	..	....	....	*	....	....	....	....	....	.....	
*	*	*	..	....	....	....	....	....	...	*	*	N. Carolina..	Pliocene.
....	..	*	*	*	....	*	....	*	*	....	....	Guadalupe ..	
....	..	....	..	*	*	*	....	*	...	....	....	Barbados....	
*	*	*	*	....	....	....	....	....	....	....	....	Georgia	
....	..	....	*	....	....	*	*	....	....	....	....	Texas.....	
....	..	*	*	....	*	*	....	*	....	....	....	St. Thomas..	
†	..	†	..	....	†	†	....	†	....	†	....	Grenada	
....	..	....	..	....	†	†	....	....	....	....	....	Cape Florida	
....	..	....	..	*	....	*	*	....	....	....	....	Corp. Christi	
....	..	*†	..	....	*	....	*	*	....	....	....	Cuba.....	
....	..	*	..	....	*	*	....	*	....	....	....	Guadalupe ..	
....	..	....	..	....	*	....	....	*	....	....	....	St. Thomas..	
....	..	....	..	....	*	....	....	*	*	....	....	Guadalupe ..	
....	..	....	..	....	*	*	....	*	*	....	....	Guadalupe ..	
....	..	*	..	....	*	*	....	*	....	....	....	Jamaica	
†	†	†	..	†*	*	....	....	*†	....	†	....	Campeche...	
†	..	....	†	....	....	....	....	....	....	†	....	Rhode Island	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus MODIOLARIA Beck.					
87	M. nigra Gray	54	2	.....	0/60	Arctic Sea...
88	M. corrugata Stimpson	53	9	.....	8/100	Arctic Sea...
89	M. lateralis Say	6	7, 8	.....	.....	Maine.....
	Genus CRENELLA Brown.					
90	C. glandula Totten	53	10	.....	5/60	Arctic Sea...
91	C. decussata Montagu	64	136*a*	.....	5/121	Arctic Sea...
92	C. divaricata Orbigny	....	.....	.....	.....	Hatteras ....
93	C. fragilis Verrill	....	.....	14.0	70	Chesapeake .
	Genus DREISSENSIA Van Ben.					
	Subgenus **Mytilopsis** Conrad.					
94	M. leucopheata Conrad	....	.....	.....	.....	Maryland ...
	Suborder ARCACEA.					
	Family ARCIDÆ.					
	Genus ARCA Linné.					
	Section ARCA Lamarck.					
95	A. noæ Linné	....	.....	.....	1/10	Hatteras ....
96	A. imbricata Bruguière	....	.....	.....	.....	Hatteras ....
	Section BARBATIA Gray.					
97	A. candida Chemnitz	....	.....	.....	0/8	Hatteras ....
98	A. ———	....	.....	.....	.....	St. Augustine
99	*A. ectocomata* Dall	6	9, 10	26.0	82/169	.....
100	A. barbata Linné	....	.....	.....	2/6	N. Carolina..

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla, Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
*	..	*	..	....	....	....	....	....	....	*	*	Hatteras	P. Pliocene.
*	..	*	..	....	....	....	....	....	....	*	*	Hatteras	P. Pliocene.
....	..	*	..	....	*	*	....	*	*	*	....	N. Grenada..	
*	..	*	..	....	....	....	....	....	....	....	....	Hatteras	P. Pliocene.
....	..	†*	..	....	....	....	....	....	....	*	*	Hatteras	
....	..	*	..	....	*	*	....	*†	....	....	....	Barbados ...	
....	†	....	..	....	....	....	....	....	....	....	....	.....	
*	*	*	..	*	....	*	....	*	....	....	....	Aspinwall...	
....	..	*	..	....	*	*	....	*	*	*	*	Carthagena .	
....	..	*	*	*	*	*	*	*	*	....	....	Aspinwall...	
....	..	*	..	....	*	*	....	*	....	....	....	Trinidad	
....	..	....	*	....	....	*	....	*	....	....	....	St. Thomas..	
....	..	....	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	*	..	....	*	*	*	*†	....	....	....	Barbados....	
*	*	*	*	*	*	*	*	*	....	....	....	St. Thomas ?.	P. Pliocene.
*	*	*	*	*	*	*	*	*	....	....	....	St. Thomas ..	
....	..	*	*	....	....	*	....	*	*	....	....	Venezuela...	Pliocene.
....	..	*	*	*	*	*	*	*	....	....	....	Trinidad	Pliocene.
*	*	*	*	*	*	....	....	....	....	....	....	Key West ...	Miocene
....	..	*	*	*	*	*	*	....	....	....	....	Aspinwall...	Pliocene
..	.	..	..	....	*	....	*	*	....	....	....	Martinique..	
.	*	*	..	..	....	?	*	....	....	....	....	.....	Pliocene.
..	*	*	..	..	....	....	....	....	....	....	....	Charleston ..	
..	.	*	*	*	*	....	*	*	....	....	....	Trinidad	Plio

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon	Range in depth.	Northern extreme range.
	Section BYSSOARCA Swainson.					
111	A. reticulata Gmelin	....	.....	.....	$\frac{0}{287}$	Hatteras ....
112	A. Adamsi Shuttleworth	....	.....	.....	$\frac{10}{32}$	Hatteras ....
113	var. Conradiana Dall	....	.....	.....	$\frac{24}{32}$	Hatteras ....
114	A. nodulosa Müller	....	.....	.....	$\frac{15}{125}$	Norway .....
115	A. pectunculoides Scacchi	8	5	8.0	$\frac{15}{1000}$	Norway .....
116	*A. polycyma* Dall	8	3, 3*a*	9.75	.....	.....
117	A. glomerula Dall	8	9, 9*a*	5.75	$\frac{100}{683}$	Hatteras ....
	Subgenus **Macrodon** Lycett.					
118	M. asperula Dall	8	4, 4*a*	8.5	$\frac{310}{1000}$	Fernandina..
119	M. sagrinata Dall	....	.....	6.0	80	Florida Str ..
120	M. profundicola Verrill	46	23, 23*a*	12.0	2021	N. Lat. 37° ..
121	M. ——	....	.....	.....	92	Florida Str ..
	Genus PECTUNCULUS Lam.					
122	P. undatus Linné	....	.....	.....	$\frac{14}{63}$	Hatteras ....
123	P. pectinatus Gmelin	....	.....	.....	$\frac{2}{175}$	Hatteras ....
	Genus LIMOPSIS Sassi.					
124	L. minuta Philippi	....	.....	.....	$\frac{30}{2221}$	Norway .....
125	L. tenella Jeffreys	....	.....	10.5	$\frac{197}{2013}$	N. Atlantic ..
126	L. antillensis Dall	8	7, 7*a*	3.5	$\frac{80}{684}$	Hatteras ....
127	L. cristata Jeffreys	....	.....	.....	$\frac{86}{1095}$	Norway .....
128	L. aurita Brocchi	....	.....	22.0	$\frac{71}{1384}$	Norway .....
129	var. *paucidentata* Dall	....	.....	9.0	874	.....
130	var. plana Verrill	....	.....	14.0	$\frac{1131}{2221}$	Chesapeake..
	Suborder NUCULACEA.					

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	†*	..	*	*	*	*	*	*	....	....	Barbados....	
....	..	*	..	....	*	*	....	*	*	....	....	St. Lucia	
....	..	*	..	....	....	†	....	....	....	....	....	Cedar Keys..	
....	..	....	..	....	† *	....	....	....	....	*	...	Sand Key....	
†	..	†	†	....	....	†	....	†	....	†	....	St. Vincent..	P. Pliocene.
....	..	....		....	....	....	....	†	....	....	....	Grenada.....	
....	..	†	..	....	†	†	....	†	....	....	....	St. Vincent..	
....	..	....	†	....	†	†	†	†	....	....	....	Yucatan	
....	..	...	..	....	†	....	....	†	....	....	....	Cuba.....	
†	..	....	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba.....	
....	..	*	*	*	*	....	....	*	....	....	....	St. Lucia....	Miocene.
....	..	*	*	....	*	*	*	*†	....	....	....	Barbados....	Pliocene.
†	..	....	.	....	†	*	....	†	....	†	....	Barbados....	Miocene.
†	..	....	..	....	†	†	....	†	....	†	....	Cuba.....	
....	..	†	..	....	†	....	....	†	....	....	....	Florida Str..	
†	..	†	†	....	†	....	†	†	....	†	....	Yucatan.....	
†	†	†	†	....	†	†	....	†	†	†	....	Grenada	Miocene.
....	..	....	..	....	....	....	....	†	....	....	....	Jamaica.....	
†	†	....	..	....	....	....	....	†	....	....	....	Dominica ...	
....	..	....	..	†	....	....	....	†	....	....	....	Bahamas	
....	..	†*	†	....	†	*	....	†	....	†	....	Trinidad	
....	..	....	..	†	†	....	†	†	....	....	....	Yucatan.....	
*	*	*	..	....	....	....	....	....	....	†*	*	Hatteras	
*†	*	†*	..	....	....	*	....	....	....	....	....	Charlotte H.	Miocene.
*	..	....	..	....	....	....	....	....	....	?	....	New Jersey..	P. Pliocene.
†	..	....	..	....	....	....	....	....	....	†	....	.....	
....	†	....	..	....	....	....	....	....	....	....	....	C. Lookout ..	
....	..	†	..	....	....	*†	....	†	....	....	....	Barbados....	
....	..	†	..	....	....	....	....	†	....	....	....	St. Vincent..	
†	†	†	..	....	....	†	....	†	....	....	....	Yucatan.....	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family LEDIDÆ.					
	Genus LEDA Schumacher.					
	Subgenus **Yoldia** Mörch.					
142	**Y. solenoides Dall**	9	2, 2*a*	12.5	118	**Miss. delta**
143	**Y. liorhina Dall**	9	1. 1*a*	13.1	100 / 1368	**Gulf of Mex.**
144	Y. limatula Say	49 56	5 1	----	8 / 510	Norway
145	Y. sapotilla Gould	56	9	------	0 / 1214	Arctic Sea
146	Y. sericea Jeffreys	----	------	------	1306 / 1701	N. Atlantic
147	Y. hebes Smith	----	------	4.0	120 / 815	Cedar Keys
148	Y. insculpta Jeffreys	----	------	------	123 / 650	N. Atlantic
149	Y. Jeffreysi Hidalgo	----	------	------	349 / 1286	N. Atlantic
150	Y. subequilatera Jeffreys	----	------	------	92 / 1731	Norway
151	Y. pompholyx Dall	----	------	4.0	504 / 1074	Fernandina
	Subgenus **Leda** Schumacher.					
152	L. Carpenteri Dall	8 9	11 3	10.5	1 / 267	Hatteras
153	L. messanensis Seguenza	----	------	4.0	33 / 2033	N. Atlantic
154	L. solidula Smith	----	------	------	640 / 1002	Hatteras
155	L. vitrea Orbigny	8	12, 12*a*	6.5	100 / 250	Florida Str.
156	L. acuta Conrad	7 45 64	3, 8 15 140	9.5 13.0	7 / 225	Rhode Island
157	L. Bushiana Verrill	----	------	15.0	100 / 516	Hatteras
158	L. concentrica Say	----	------	------	------	Texas
159	L. Verrilliana Dall	----	------	13.0	------	Hatteras
160	L.			4.1	737	Cedar Keys

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
---	--	----	--	----	----	†	†	----	----	----	----	Yucatan.....	
----	--	----	--	----	†	†	----	†	----	----	----	Barbados....	
*	*	*	--	----	----	----	----	----	----	*	*	N. Carolina..	Pliocene.
*†	-	†	--	----	----	----	---	----	----	*	*	Hatteras	
†	†	†	--	†	----	----	----	†	----	†	----	Florida Str..	
----	--	----	--	----	----	†	----	†	----	----	----	Culebra Id ..	
----	--	----	--	†	†	----	----	†	----	†	----	Florida Str ..	
----	--	†	--	----	†	----	----	†	†	†	----	Florida Str ..	
----	--	†	--	----	----	†	----	----	----	†	----	Grenada	
----	--	----	†	†	†	----	----	†	----	----	----	Cuba	
----	--	†	--	†	†*	----	----	†	----	----	----	Barbados....	
†	†	†*	†	†	†	----	----	†	†	*	----	Barbados....	Pliocene.
----	--	†	--	----	†	†	†	†	----	----	----	Brazil.....	
----	--	----	--	----	†	----	----	†	----	----	----	Barbados....	
----	--	†*	*	----	†	*†	----	†	----	----	----	Sombrero ...	Miocene.
----	--	†	--	†	----	----	----	---	----	----	----	Florida Str ..	
----	--	----	--	----	----	*	*	*	----	----	----	Trinidad	Pliocene.
----	--	†*	--	----	----	----	----	----	----	----	----	Cape Fear...	
----	--	----	--	----	†	†	----	†	----	----	----	Cuba.....	
----	--	----	--	†	†	----	----	†	----	----	----	Cuba.....	
----	--	†	--	----	†	----	----	†	----	----	----	Cuba.....	
----	--	----	--	----	†	----	†	†	----	†	----	Bequia.....	Pliocene.
----	--	----	--	----	†	----	----	†	----	----	----	Cuba.....	
----	--	----	--	†	----	†	----	†	----	----	----	Florida Str ..	
----	--	----	--	----	†	----	----	†	----	----	----	Jamaica	
----	--	----	--	†	----	†	----	†	----	----	----	St. Vincent..	
----	--	----	--	----	----	†	----	†	----	----	----	Tobago	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Section NEILO A. Ad.					
169	M. dilatata Philippi	....	.....	.....	223/382	N. Atlantic..
170	M. ———	....	.....	.....	1181	Cedar Keys..
171	M. obtusa Sars	....	.. ...	.....	116/1668	Norway .....
	Genus GLOMUS Jeffreys.					
172	G. nitens Jeffreys	....	.....	.....	234/1750	Norway .....
	Suborder SOLENOMYACEA.					
	Family SOLENOMYIDÆ.					
	Genus SOLENOMYA Lamarck.					
173	S. velum Say	58	3	20.0	0/84	Nova Scotia.
174	S. ———	....	.....	12.0	22/300	C. Lookout..
175	S. occidentalis Deshayes	....	.....	7.0	0/8	Gulf of Mex .
	Order TELEODESMACEA.					
	Suborder CARDITACEA.					
	Family CARDITIDÆ.					
	Genus CARDITA Bruguière.					
176	C. domingensis Orbigny	....	.....	.....	30/124	Hatteras ....
177	C. Conradii Shuttleworth ?	....	.....	.....	.....	Tampa .....
178	C. floridana Conrad	....	.....	.....	.....	Tampa .....
179	C. gracilis Shuttleworth	....	.....	.....	.....	Tampa .....
	Subgenus **Venericardia** Lamarck.					
180	V. borealis Conrad	58	9	.....	5/100	Arctic Sea...
181	var. granulata Say				5/8	Rhode Island

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	†	....	....	†	....	†	....	Old Provid'ce	Pliocene.
....	..	....	..	....	....	†	....	....	....	....	....	.....	....
†	†	†	..	....	....	....	....	....	....	†	....	Hatteras	
....	..	....	†	†	....	....	....	†	....	....	....	Cuba.....	....
*	*	*	..	....	....	....	....	....	....	....	....	N. Carolina..	P. Pliocene.
....	..	*	..	....	....	....	†	†	....	....	....	Cuba.....	
....	..	....	..	....	*	*	....	*			†	Guadalupe ..	
..	..	†*	..	....	†	....	....	*†	....	....	....	Sombrero ...	
..	..	....	..	....	*	*	....	....	....	....	....	Key West ...	Miocene.
..	..	....	..	....	*	*	....	....	....	....	....	Key West ...	
..	..	....	..	....	....	*	....	....	....	....	....	.....	
..	..	†	..	....	....	....	....	....	....	†	†	Hatteras	Miocene.
..	..	†*	..	....	....	....	....	....	....	....	....	Hatteras	Miocene.
....	..	....	..	....	....	....	....	....	....	....	*	Rhode Island	
....	..	†*	..	....	....	*	....	....	....	....	....	Charlotte H .	Miocene.
....	..	*	†	....	....	*	....	....	....	....	....	Charlotte H .	Miocene.
....	..	*	..	....	....	....	....	....	....	....	....	Hatteras	P. Pliocene.
*	..	†	..	....	....	....	....	....	....	....	....	Hatteras	P. Pliocene.
....	..	†*	†	....	†	....	....	....	....	....	....	Cape Florida	
....	..	....	..	....	†	†	....	†	....	....	....	Barbados....	
....	..	....	†	....	†	....	....	†	....	....	....	Cuba.....	
....	..	†*	..	....	*	*	....	*	....	....	....	Sombrero ...	
....	..	†*	..	....	....	....	....	....	....	....	....	Cape Fear...	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus GEMMA Deshayes.					
283	G. purpurea H. C. Lea	56	11	.....	.....	Labrador
284	var. manhattanensis Prime	....	.....	.....	.....	Cape Cod
	Genus CYTHEREA Lamarck.					
285	C. Simpsoni Dall	....	....	.....	.....	Tampa
286	C. convexa Say	56, 64	15, 142a	50.0	2/63	Pr. Edw. Isl.
287	C. albida Gmelin	....	.....	.....	0/0	Florida Str.
288	C. ?obovata Conrad	....	.....	.....	1/10	C. Lookout
289	C. hebræa Lamarck	....	.....	.....	0/8	Hatteras
290	C. ——	....	.....	.....	0/11	Hatteras
291	C. ? idonea Conrad	....	.....	.....	.....	Texas
	Subgenus **Callista** Mörch.					
292	C. maculata Linné	....	.....	.....	0/8	Hatteras
293	C. gigantea Gmelin	....	.....	.....	.....	Hatteras
	Subgenus **Transennella** Dall.					
294	T. Conradina Dall	....	.....	.....	0/1	Hatteras
295	T. cubaniana Orbigny	....	.....	.....	0/0	Cape Florida
	Subgenus **Dione** Gray.					
296	D. Dione Linné	....	.....	.....	.....	Gulf of Mex.
	Subgenus **Tivela** Link.					
297	T. mactroides Born	....	.....	.....	.....	Florida Keys?
	Subgenus **Veneriglossa** Dall.					

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
*	*	*	..	....	....	....	....	....	....	....	....	N. Carolina..	
*	*	*	..	....	....	....	....	....	....	....	....	N. Carolina..	
....	..	....	..	....	*	*	...	*	....	....	....	Martinique ..	Pliocene.
*	*	*†	..	....	....	*	....	....	....	....	....	Tampa	
....	..	....	..	....	*	....	....	*	....	....	....	N. Grenada ..	
....	..	*	..	....	....	*†	....	†	....	....	....	Grenada	
....	..	*†	..	....	†*	*	....	†*	*	....	....	Barbados....	
....	..	*	..	....	†	†	....	....	....	....	....	Gulf of Mex .	
....	..	....	..	....	....	....	*	....	....	....	....	Gulf of Mex .	
....	..	*	*	*	*	*	*	*	....	....	....	Guadalupe ..	
....	..	*	..	....	*	*	*	*	....	....	....	Cuba?	
....	..	*	..	....	*	*	...	....	....	....	....	Key West ...	
....	..	....			*	....	...	*	....	....	....	Santa Cruz..	
....	..	....			*	....	*	*	....	....	....	Aspinwall...	
....	..	†	..	....	*	....	....	*	....	....	....	Carthagena .	
..	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	*	*	*	*	....	*	*	....	....	....	....	Vera Cruz...	
....	..	*	*	*	*	*	*	*	....	....	....	Aspinwall...	
....	..	*	..	....	*	*	....	*	....	....	....	Trinidad	
....	..	....	*	....	*	*	*	*	....	....	....	Cuba.....	

TABLE II. B —*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Section EGETA, H. & A. Adams.					
303	C. floridana Conrad					Tampa
	Suborder TELLINACEA.					
	Family PETRICOLIDÆ.					
	Genus PETRICOLA Lamarck.					
304	P. pholadiformis Lamarck	59 64	15 140*a*			Pr. Edw. Isl.
305	var. dactylus Lamarck					Maine
306	P.				Coral	Florida Keys.
	Subgenus Choristodon Jonas.					
307	C. robusta Sowerby					Cape Florida
308	C.? cancellata Verrill			8.0	70	Chesapeake
	Subgenus **Naranaio** Gray.					
309	N. lapicida Gmelin				[illegible]	Florida Keys
	Genus CORALLIOPHAGA Blainv.					
310	C. carditoidea Blainville				[illegible]	Cedar Keys
	Family DONACIDÆ.					
	Genus DONAX Linné.					
311	D. denticulatus Linné					Texas
312	D. variabilis Say					Hatteras
313	D. fossor Say			12.5		New Jersey
314	D. obesa Orbigny					St. Augustine
	Genus IPHIGENIA Schum.					

[redacted]

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
						*							
*	*	*	*	*	*		*	*				St. Thomas	Pliocene.
*		*										S. Carolina	Pliocene.
					*								
		*			*	*		*				Guadalupe	
*	*								*				
					* †			*				Martinique	
						*	*	*	*			St. Thomas	
					*	*	*	*				Rio Janeiro	
		*	*	*	*	*	*	*				St. Thomas	
*	*	*	*	*	*	*	*					Florida Keys	
			*				*					Texas	
				*	*	*	*	*				Brazil	
			*	*	*	*		*	*		*	Trinidad	
						? *							
*	*	*	*	*		*	*	*		*	?	Trinidad	Miocene.
*	*	*	*		*	*		*				Guadalupe	Pliocene.
							*	*			*	Aspinwall	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
234	L. sagrinata Dall			7.6	$\frac{88}{200}$	Gulf of Mex.
235	L. multilineata Conrad			15.0	$\frac{8}{287}$	C. Lookout..
236	L. lintea Conrad				$\frac{0}{800}$	Hatteras ....
237	L. scabra Lamarck				$\frac{10}{182}$	Florida Str..
	Genus LORIPES Poli.					
238	L. edentula Linné				$\frac{8}{50}$	Hatteras ....
239	var. chrysostoma Mörch					Tampa .....
240	L. lens Verrill and Smith				$\frac{8}{161}$	Cape Cod ...
241	L. compressa Dall	14	2	10.0	$\frac{12}{424}$	Gulf of Mex.
	Family DIPLODONTIDÆ.					
	Genus DIPLODONTA Turton.					
242	D. turgida V. & S	45 64 65	10, 11 136 135	25.0	$\frac{18}{170}$	Rhode Island
243	D. subglobosa C. B. Adams				$\frac{3}{124}$	Hatteras ....
244	D. soror C. B. Adams					Tortugas ....
245	D. semiaspera Philippi				$\frac{14}{294}$	Hatteras ....
	Suborder CHAMACEA.					
	Family CHAMIDÆ.					
	Genus CHAMA Bruguière.					
246	C. arcinella Linné				$\frac{0}{20}$	Hatteras ....
247	C. sarda Reeve				$\frac{0}{23}$	Cape Florida
248	C. congregata Conrad				$\frac{0}{82}$	Hatteras ....
249	C. macrophylla Chemnitz				$\frac{0}{287}$	Tampa .....
250	C. lactuca Dall			25.0	$\frac{63}{100}$	Hatteras ....
	Suborder CARDIACEA.					

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	†	†	....	†	....	....	....	Yucatan	
....	..	*	..	*†	*	*	....	†	....	....	....	Grenada	Pliocene.
....	..	*	..	†	*†	*	....	*	....	....	....	Cuba	Pliocene.
....	..	....	..	....	†	....	....	†	....	....	*	Guadalupe ..	
....	..	†	.		*	*	*	....	*	....	....	Martinique ..	Pliocene.
....	..	....	.		*	*	....	....	....	....	....	Santa Cruz ..	
....	..	....	.		†	....	....	†	....	....	....	Grenada	
....	..	....	.		....	....	†	†	....	....	....	Sombrero . ..	
†	..	†*	..	....	....	....	....	†	....	....	....	Grenada	
....	..	†*	..	....	*	*	....	*†	....	....	....	Trinidad	Pliocene.
....	..	....	..	....	*	....	....	*	....	....	....	Jamaica.....	
....	..	†*	†	†	*	....	....	†*	....	....	....	St. Thomas..	Pliocene.
....	..	*	..	....	*	*	*	*	....	....	....	Guadalupe ..	Pliocene.
....	..	....	..	....	*†	....	....	*†	....	....	....	Trinidad	
....	..	*	..	....	....	*	....	*	....	....	....	Yucatan	Miocene.
....	..	?	..	....	*	*	....	*†	*	....	....	Curaçoa.....	Pliocene.
....	..	†	..	....	..	....	....	†	....	....	....	Barbados....	
....	*	*	*	*	*	*	*	*	....	....	....	Cuba	Pliocene.
....	..	*	..	....	*	*	....	*	*	....	....	Trinidad	
....	..	*	*	*	*	*	*	*	....	....	....	Trinidad	Pliocene.
....	..	....	..	....	*	....	....	†*	....	....	....	Guadalupe ..	Pliocene.
....	..	†*	..	....	....	....	....	....	....	....	....	C. Lookout..	P. Pliocene.
?	..	*†	..	....	....	....	....	....	....	....	....	Hatteras	
....	..	†	..	†	†	†	....	*†	....	....	....	Grenada	
....	..	....	..	....	†*	....	....	†*	....	....	....	Barbados....	
....	..	*	*	....	*	*	....	*†	....	....	....	Brazil.....	Pliocene.

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Subgenus **Papyridea** Swainson.					
260	P. bullata Linné	....	.....	.....	$\frac{3}{100}$	Hatteras
261	P. Petitiana Orbigny	....	.....	.....	$\frac{3}{100}$	Cape Florida.
	Subgenus **Liocardium** Swainson.					
262	L. serratum Linné	....	.....	.....	$\frac{0}{5\frac{1}{2}}$	Hatteras ....
263	L. lævigatum Linné	....	.....	.....	$\frac{0}{7\frac{1}{8}}$	Hatteras ....
264	L. Mortoni Conrad	58	8	21.0	$\frac{0}{8}$	Nova Scotia.
	Family VENILIIDÆ.					
	Genus CYPRINA Lamarck.					
265	C. islandica Linné	57	1	58.0	$\frac{0}{50}$	Arctic Ocean
	Family ISOCARDIIDÆ.					
	Genus ISOCARDIA Lamarck.					
	Subgenus **Meiocardia** H. & A. Adams.					
266	*M. Agassizii* Dall	40	7	22.0	117	
	Genus CALLOCARDIA A. Adams.					
	Subgenus **Vesicomya** Dall.					
267	V. pilula Dall	8	13	2.6	$\frac{224}{1091}$	Fernandina.
268	V. venusta Dall	40	5	19.0	$\frac{107}{501}$	Cape Fear...
	Suborder VENERACEA.					
	Family VENERIDÆ.					
	Genus VENUS Linné.					
		55	7			

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*	*	....	*	*†	....	*†	....	....	?	Brazil.....	
....	..	....	..	....	*	....	....	*†	....	....	....	Trinidad	
....	..	*	*	*	*	*	....	*	*	....	....	Guadalupe ..	
....	..	*	*	*	*†	*	....	*†	*	....	....	Guadalupe ..	
....	..	*	*	*	....	*	....	....	....	....	....	Charlotte H.	P. Pliocene.
....	..	*	..	....	....	....	....	....	....	*†	....	Hatteras	Pliocene.
....	..	....	..	....	....	....	....	†	....	....	....	Trinidad	
....	..	....	†	....	†	....	....	†	....	....	....	Bequia.....	
....	..	†	..	....	†	....	....	†	....	....	....	Cuba.....	
*	*	*	*	*	*	*	*	....	....	*	....	Yucatan	Miocene.
....	*	*	*	*	*	*	*	....	....	....	....	Florida Keys.	Miocene.
....	..	....	..	....	*	*	....	*	....	....	....	Porto Rico .	
....	..	†	..	....	†	....	....	†*	....	....	....	Rio Janeiro..	
....	..	....	..	....	†	*	....	....	....	....	?	Florida Str..	Pliocene.
....	..	....	..	....	†	....	†	†	....	....	....	Barbados....	
....	..	†*	..	....	....	*	*	....	....	....	....	Honduras ...	Miocene.
....	..	*	..	*	*	*	....	*	*	....	....	Trinidad	
....	..	....	..	....	*	....	....	*	....	....	....	Aspinwall...	
....	..	†*	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	†	....	....	*	....	....	....	Carthagena..	
....	..	*†	*	*	*	*	....	*	....	....	....	Guadalupe ..	
....	..	*†	..	*	....	*	*	*	....	....	....	Barbados....	Miocene.
....	..	....	..	*	*	*	*	*	....	....	....	Cuba.....	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus GEMMA Deshayes.					
283	G. purpurea H. C. Lea	56	11	.....	.....	Labrador
284	var. manhattanensis Prime	....	.....	.....	.....	Cape Cod
	Genus CYTHEREA Lamarck.					
285	C. Simpsoni Dall	....	....	.....	.....	Tampa
286	C. convexa Say	56, 64	15, 142a	50.0	2/3	Pr. Edw. Isl.
287	C. albida Gmelin	....	.....	.....	2/0	Florida Str.
288	C. ?obovata Conrad	....	.....	.....	1/10	C. Lookout
289	C. hebræa Lamarck	....	.....	.....	8/8	Hatteras
290	C. ——	....	.....	.....	20/17	Hatteras
291	C. ? idonea Conrad	....	.....	.....	.....	Texas
	Subgenus **Callista** Mörch.					
292	C. maculata Linné	....	.....	.....	0/8	Hatteras
293	C. gigantea Gmelin	....	.....	.....	.....	Hatteras
	Subgenus **Transennella** Dall.					
294	T. Conradina Dall	....	.....	.....	0/7	Hatteras
295	T. cubaniana Orbigny	....	.....	.....	0	Cape Florida
	Subgenus **Dione** Gray.					
296	D. Dione Linné	....	.....	.....	.....	Gulf of Mex.
	Subgenus **Tivela** Link.					
297	T. mactroides Born	....	.....	.....	.....	Florida Keys?
	Subgenus **Veneriglossa** Dall.					

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
*	*	*	..	....	....	....	....	....	....	....	....	N. Carolina..	
*	*	*	..	....	....	....	....	....	....	....	....	N. Carolina..	
....	....	....	..	....	*	*	....	*	....	....	....	Martinique ..	Pliocene.
*	*	*†	..	....	....	*	....	....	....	....	....	Tampa	
....	..	....	..	....	*	....	....	*	....	....	....	N. Grenada ..	
....	..	*	..	....	....	*†	....	†	....	....	....	Grenada	
....	..	*†	..	....	†*	*	....	†*	....	....	....	Barbados....	
....	..	*	..	....	†	†	....	....	....	....	....	Gulf of Mex .	
....	..	....	..	....	....	....	*	....	....	....	....	Gulf of Mex .	
....	..	*	*	*	*	*	*	*	....	....	....	Guadalupe ..	
....	..	*		....	*	*	*	*	....	....	....	Cuba?	
....	..	*			*	*	....	....	....	....	....	Key West ...	
....	..	....			*	....	....	*	....	....	....	Santa Cruz..	
....	..	....			*	....	*	*	....	....	....	Aspinwall...	
....	..	?	..	....	*	....	....	*	....	....	....	Carthagena .	
..	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	*	*	*	*	....	*	*	....	....	....	....	Vera Cruz...	
....	..	*	*	*	*	*	*	*	....	....	....	Aspinwall...	
....	..	*	..	....	*	*	....	*	....	....	....	Trinidad	
....	..	....	*	....	*	*	*	*	....	....	....	Cuba.....	

TABLE II. B —*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Section EGETA, H. & A. Adams.					
303	C. floridana Conrad					Tampa
	Suborder TELLINACEA.					
	Family PETRICOLIDÆ.					
	Genus PETRICOLA Lamarck.					
304	P. pholadiformis Lamarck	59 64	15 140*a*			Pr. Edw. Isl.
305	var. dactylus Lamarck					Maine
306	P				Coral	Florida Keys.
	Subgenus **Choristodon** Jonas.					
307	C. robusta Sowerby					Cape Florida
308	C.? cancellata Verrill			8.0	70	Chesapeake
	Subgenus **Naranaio** Gray.					
309	N. lapicida Gmelin				[illegible]	Florida Keys
	Genus CORALLIOPHAGA Blainv.					
310	C. carditoidea Blainville				$\frac{0}{30}$	Cedar Keys
	Family DONACIDÆ.					
	Genus DONAX Linné.					
311	D. denticulatus Linné					Texas
312	D. variabilis Say					Hatteras
313	D. fossor Say			12.5		New Jersey
314	D. obesa Orbigny					St. Augustine
	Genus IPHIGENIA Schum.					

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Ber-mu-da.	Eur.	West Am.	Southern extreme range.	Range in time.
						*							
*	*	*	*	*	*		*	*				St. Thomas	Pliocene.
*		*										S. Carolina	Pliocene.
					*								
		*			*	*		*				Guadalupe	
*	*								*				
					* †			*				Martinique	
						*	*	*	*			St. Thomas	
					*	*	*	*				Rio Janeiro	
		*	*	*	*	*	*	*				St. Thomas	
*	*	*	*	*	*	*	*					Florida Keys	
			*				*					Texas	
				*	*	*	*	*				Brazil	
			*	*	*	*		*	*		*	Trinidad	
						? *							
*	*	*	*	*		*	*	*		*	?	Trinidad	Miocene.
*	*	*	*		*	*		*				Guadalupe	Pliocene.
							*	*			*	Aspinwall	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus SANGUINOLARIA Lamarck.					
321	S. rosea Lamarck					Gulf of Mex.
	Genus ASAPHIS Modeer.					
322	A. deflorata Linné					Charlotte H.
	Family TELLINIDÆ.					
	Genus TELLINA Linné.					
323	T. magna Spengler					Hatteras
324	T. radiata Linné					Cedar Keys.
325	T. lævigata Linné					Tampa
326	T. fausta Solander					Hatteras
327	T. alternata Say					Hatteras
328	T. striata Hanley					Florida Keys.
329	*T. nitida* Lamarck					
330	var. carolinensis Dall				$\frac{2}{50}$	Hatteras
331	T. interrupta Wood					C. Lookout.
332	T. lineata Turton					St. Augustine
333	T. squamifera Deshayes				$\frac{23}{53}$	Hatteras
334	T. sybaritica Dall	6	11	7.0	$\frac{50}{640}$	Gulf of Mex.
335	T. tenella Verrill	56	12		$\frac{4}{10}$	Cape Cod
336	T. tenera Say	55 56	1) 13)	8.0	$\frac{0}{80}$	Gaspé
337	T. versicolor Cozzens				$\frac{12}{50}$	New York
338	T. polita Say					N. Carolina.
339	T. modesta Verrill					Hatteras
340	T. decora Say				$\frac{0}{2}$	Bermuda
341	T. iris Say					N. Carolina.

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat. Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Ber-mu-da.	Eur.	West Am.	Southern extreme range.	Range in time.
....				....	*	*	*	*	...	*	Trinidad	
....				*	*	....	*	....	....	....	Brazil.....	
....	..	..	..	*	*	....	*	*	....	....	St. Thomas ..	
....	..	....	..	....	*	*	....	*	*	....	....	Guadalupe ..
....		....	..	....	....	*	....	*	*	....	....	Guadalupe ..
....		*	..	*	*	....	....	*	..	....	....	Trinidad ....
....		*	*	*	*	*	*	*	....	....	....	Haiti ..... Pliocene.
....		....	..	....	*	....	....	*	...	....	....	N. Grenada..
....		....	..	....	....	....	....	....	....	*	....	Medit'ranean
....	..	* †	..	....	....	*	....	*	....	....	....	St. Thomas..
....	..	*	..	....	*	*	....	*	*	....	*	Brazil.....
....	..	....	*	*	*	*	....	*	..	....	....	Brazil.....
....	..	* †	..	....	*	*	....	* †	...	....	....	Sombrero ...
....	..	....	..	....	....	*	....	†	....	....	....	Brazil.....
....	..	....	..	....	....	*	....	....	....	....	....	Tampa.....
*	*	*	*	....	*	*	....	* †	....	....	....	Barbados.... Pliocene.
....	..	*	*	....	....	*	....	* †	....	....	....	Barbados....
....	..	*	*	*	....	*	....	....	....	....	....	Sarasota ....
....	..	*	..	....	*	*	*	....	*	....	...	Yucatan ....
....	..	....	..	....	*	*	....	*	*	....	....	Aspinwall...
....	..	*	*	*	....	*	....	*	....	....	....	Guadalupe ..
....	..	....	..	....	*	*	....	*	....	....	....	St. Thomas ..
....	..	....	..	....	....	*	....	*	....	....	....	Guadalupe ..
....	..	....	..	....	*	....	....	*	*	....	....	Curaçoa.....
....	..	*	..	....	....	*	....	*	....	....	....	Jamaica ....
....	..	*	..	*	*	....	....	*	....	....	....	Yucatan.....
...	..	*	..	*	....	*	*	*	....	....	....	Trinidad ....
....	..	*	..	....	*	*	*	*	....	....	....	R. La Plata..
*	*	*	*	....	*	*	....	*	....	....	....	Haiti.....
....	..	....	..	....	*	*	....	*	....	....	....	Guadalupe ..
...	..	*	..	....	....	*	....	*	....	....	....	Barbados....
....	..	....	..	....	....	*	....	....	....	....	....	.....
*	*	*	*	....	....	....	....	....	....	....	....	Georgia ..... Pliocene.
....	..	....	..	....	*	*	....	*	....	....	....	Jamaica ....
....	..	....	..	....	....	*	....	....	....	....	....	Charlotte H.

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus TELLIDORA Mörch.					
356	T. cristata Recluz	....	.....	.....	.....	N. Carolina .
	Genus STRIGILLA Turton.					
357	S. carnaria Linné	....	.....	.....	.....	Hatteras ....
358	S. pisiformis Linné	....	.....	.....	.....	Key West ...
359	S. flexuosa Say	....	.....	.....	0/20	Hatteras ....
	Genus LUTRICOLA Blainville.					
360	L. interstriata Say	....	.....	.....	.....	Florida Keys
	Genus GASTRANELLA Verrill.					
361	G. tumida Verrill	59	8	4.0	4/22	Connecticut .
	Family SEMELIDÆ.					
	Genus ABRA (Leach) Risso.					
362	A. longicallus Scacchi	...	.....	.....	50/1467	Aretic Sea...
363	A. æqualis Say	....	.....	.....	.....	Connecticut?
364	A. lioica Dall	4	8	8.1	14/860	Rhode Island
	Genus CUMINGIA Sowerby.					
365	C. tellinoides Conrad	56	14	18.0	0/20	Cape Cod ...
	Genus ERVILIA Turton.					
366	E. nitens Montagu	....	.....	.....	.....	Tortugas ....
367	E. concentrica Gould	....	.....	....	0/124	Hatteras ....
	Genus SEMELE Schumacher.					
368	S. reticulata Gmelin	....	.....	.....	.....	Virginia ....

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*	..	....	*	*	....	*	....	....	....	Trinidad	Pliocene.
....	..	*	..	....	*	....	....	*	....	....	?	Trinidad	Pliocene.
....	..	....	..	....	*	....	....	*	....	....	....	Guadalupe ..	
....	..	*	*	....	*	*	....	*	....	....	....	Haiti	P. Pliocene.
....	..	....	..	....	*	*	....	*	*	....	....	Guadalupe ..	
....	..	*	..	....	....	....	....	....	...	....	?	C. Lookout..	
†	†	....	..	....	†	†	....	†	....	†	....	Grenada	Pliocene.
....	..	*	*	*	....	*	*	....	....	....	....	Gulf of Mex.	Miocene.
....	..	†*	..	....	†*	*	....	*†	....	....	....	Martinique..	
*	*	*	..	....	*	*	....	*	....	....	....	Guadalupe ..	Miocene.
....	..	....	..	...	*	....	....	*	....	....	....	Guadalupe ..	Pliocene.
....	.	†*	*	....	*	*	....	....	*	....	....	Key West ...	
....	*	*	..	....	.	*	*	*	*	....	....	Guadalupe ..	
....	..	*	..	....	*	*	....	*	....	....	....	Trinidad	
....	..	*†	..	....	*	*	....	*	*	....	....	Martinique ..	Pliocene.
....	..	*†	..	....	....	*	....	....	....	....	....	Tampa	Miocene.
....	..	....	..	....	....	*	*	....	....	....	....	W. Florida ..	Pliocene.
....	..	....	..	....	....	....	*	....	....	....	....	Texas	
*	..	*	..	....	....	....	....	....	....	....	....	Hatteras	Miocene.
....	..	*	*	*	*	*	*	?*	....	....	....	St. Thomas..	Pliocene.
....	..	*	*	*	*	*	*	*	....	....	....	Brazil	Pliocene.
*	*	*	*	*	*	*	*	....	.....	.....	....	Florida Str..	Miocene.

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus LABIOSA Schmidt.					
378	L. lineata Say	....	.....	.....	.....	New Jersey..
379	L. canaliculata Say	....	.....	.....	.....	New Jersey..
	Order ANOMALODESMACEA.					
	Suborder ANATINACEA.					
	Family ANATINIDÆ.					
	Genus THRACIA Blainv.					
380	T. Conradi Couthouy	69	9	.....	$\frac{2}{15}$	Labrador....
381	T. Stimpsoni Dall	....	.....	65.0	28	.....
382	T. corbuloidea Blainville	....	.....	.....	$\frac{14}{80}$	Hatteras ....
383	T. distorta Montagu	....	.....	.....	.....	Gulf of Mex.
384	T. phaseolina Lamarck	....	.....	.....	.....	Britain.....
	Genus ASTHENOTHÆRUS Cpr.					
385	A. Hemphillii Dall	....	.....	6.25	$\frac{2}{17}$	Gulf of Mex.
	Subgenus **Bushia** Dall.					
386	B. elegans Dall	39	1	12.5	$\frac{44}{78}$	Florida Str..
	Genus PERIPLOMA Schum.					
387	P. inæquivalvis Schumacher	....	.....	.....	.....	Texas ?.....
388	P. angulifera Philippi	....	.....	.....	.....	Gulf of Mex.
389	P. tenera Jeffreys	....	.....	.....	.....	Hatteras ....
390	P. fragilis Totten	59	7	.....	$\frac{10}{100}$	Labrador....
391	P. papyracea [Say] Conrad	....	.....	.....	.....	Gulf of Mex.
	Subgenus **Cochlodesma** Couthouy.					

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
*	..	*	..	*	....	*	*	*	....	....	....	Cuba.....	
*	*	*	*	*	*	*	*	....	....	....	....	Gulf of Mex.	P. Pliocene.
*	..	*	..	....	....	....	....	....	....	....	....	Hatteras	P. Pliocene.
....	..	....	..	....	*	....	....	....	....	....	....	Tortugas	
....	..	*†	..	....	*	....	....	....	....	*	....	Key West ...	
....	..	....	..	....	....	*	*	*	....	*	....	Honduras ...	
....	..	....	..	....	*	....	†	†	....	*	....	Yucatan.....	
....	..	....	..	....	*	*	....	....	....	....	....	Marco, Fla ..	
....	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	....	....	?	*	....	....	....	Trinidad	
....	..	....	..	....	*	*	*	....	....	....	....	Honduras ...	
....	..	†	..	†	†	....	....	....	....	†	....	Florida Keys	
*	..	....	..	....	....	....	....	†	....	....	....	.....	
....	..	....	..	....	....	*?	....	....	....	....	....	Santa Cruz..	
*	..	*	..	....	....	....	....	....	....	....	....	Hatteras	Pliocene.
*	..	*	..	....	....	*	*	..	....	....	....	Texas	Miocene.
....	..	....	..	....	....	*	*	*	....	....	....	Nicaragua....	
....	..	*	..	...	*	*	....	....	....	....	?	Guadalupe ..	
....	..	....	..	....	†	....	....	†	....	†	....	Campeche ...	
?	..	....	..	...	....	....	....	....	....	....	....	.....	
†	..	....	..	....	....	....	....	....	....	*	....	Rhode Isl'd ?.	
†	..	....	..	....	....	....	....	....	..	*	...	Rhode Island.	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Section RHINOCLAMA D. & S.					
424	L. halimera Dall	....	.....	10.0	731	Cape Fear...
	Subgenus **Halonympha** D. & S.					
425	H. claviculata Dall	2	2, 2*a*	12.0	$\frac{100}{839}$	N. Atlantic ..
	Genus MYONERA Dall and Smith.					
426	M. paucistriata Dall	....	.....	10.0	$\frac{183}{850}$	Cape Clear..
427	M. undata Verrill	....	.....	.....	$\frac{450}{2727}$	Chesapeake .
428	M. lamellifera Dall	3	7	12.5	$\frac{84}{250}$	Cedar Keys..
429	M. limatula Dall	3	5	11.2	539	Florida Str ..
	Family POROMYIDÆ.					
	Genus POROMYA Forbes.					
430	P. granulata Nyst	....	.....	.....	$\frac{15}{300}$	Norway .....
431	var. rotundata Jeffreys	....	.....	.....	$\frac{50}{1430}$	N. Atlantic ..
432	P. neæroides Seguenza	....	.....	.....	$\frac{100}{286}$	N. Atlantic ..
433	P. sublevis Verrill	65	128	.....	$\frac{122}{1635}$	Chesapeake .
	Section CETOMYA Dall.					
434	P. elongata Dall	39	3	22.5	$\frac{100}{189}$	Gulf of Mex .
435	P. tornata Jeffreys	....	.....	.....	$\frac{1140}{1745}$	N. Atlantic ..
436	P. albida Dall	....	.....	21.5	$\frac{28}{731}$	Cape Fear...
	Genus CETOCONCHA Dall.					
437	C. bulla Dall	65 39	130 2, 5	13.0	$\frac{1217}{1920}$	Chesapeake .
438	C. margarita Dall	8	10	7.3	$\frac{391}{1019}$	Florida Keys.

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	†	..	....	....	....	....	....			....	.....	
....	..	....	..	....	†	....	....	†	†	....	....	Barbados....	
....	..	†	..	....	†	....	....	†	....	....	....	Tobago	
....	†	....	..	....	†	....	....	†	....	....	....	St. Vincent..	
....	..	....	..	....	†	†	....	†	....	....	....	Jamaica.....	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba.....	
....	..	†	..	....	†	....	....	†	....	†*	....	Barbados....	Miocene.
....	..	†	†	....	....	....	....	†	....	†	....	Barbados....	
....	..	....	..	†	....	....	....	†	....	....	....	Barbados....	
....	†	....	..	....	....	....	....	....	....	....	†	Patagonia ..	
....	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	....	†	....	....	....	....	†	....	....	....	Grenada	
....	..	†	..	....	†	....	....	†	....	....	....	Cuba.....	
....	†	....	..	....	†	†	....	....	....	....	....	Gulf of Mex .	
....	..	....	..	....	†	....	....	†	....	....	....	Brazil.....	
....	..	*	..	....	....	*	*	....	....	....	....	Gulf of Mex .	
*	..	†*	..	....	....	....	....	....	....	....	....	N. Carolina?.	Pliocene.
....	..	*†	..	....	....	*	†	†	....	....	....	Yucatan	
....	..	†	..	....	†	....	....	....	....	*	*	Florida Str ..	
....	..	....	..	....	....	*	....	....	....	....	....	Charlotte H .	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Suborder MYACEA.					
	Family CORBULIDÆ.					
	Genus PARAMYA Conrad.					
444	P. subovata Conrad	....	.....	.....	$\frac{1}{41}$	Hatteras ....
	Genus BASTEROTIA Mayer.					
445	B. quadrata Hinds	1	2*a–b*	10.0	$\frac{6}{640}$	C. Lookout ..
	Genus CORBULA Bruguière.					
446	C. disparilis Orbigny	1	4*a–b*	.....	$\frac{5}{805}$	Hatteras ....
447	C. Krebsiana C. B. Adams	1	1*a–b*	6.1	$\frac{3}{85}$	Cape Florida.
448	C. contracta Say	1 59	6*a–b* 10	12.0	$\frac{3}{63}$	Cape Cod ...
449	C. Dietziana C. B. Adams	1	5*a–b*	10.7	$\frac{14}{100}$	Hatteras ....
450	C. Barrattiana C. B. Adams	2	7*a,b,c*	8.9	$\frac{22}{287}$	Hatteras ....
451	C. Cubaniana Orbigny	1	3*a,b,c*	12.7	$\frac{2}{100}$	Fla. Strait ..
452	C. Swiftiana C. B. Adams	2	5*a,b,c*	10.4	$\frac{7}{450}$	Hatteras ....
453	C. cymella Dall	1	7, 7*a*	13.5	$\frac{68}{80}$	C. Florida...
454	C. nasuta Say	2	6*a, b, c, d*	8.5	$\frac{4}{68}$	Hatteras ....
	Family MYIDÆ.					
	Genus MYA Linné.					
455	M. arenaria Linné	49 55 69	9 2 2	75.0	$\frac{0}{40}$	Arctic Sea...
	Family SAXICAVIDÆ.					
	Genus SAXICAVA F. de B.					
456	S. arctica Linné	59	13	30.0	$\frac{0}{100}$	Arctic Sea...

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....		*	..	....	....	*	....	....	....	....	....	Tampa.....	Miocene.
....	..	*	..	....	*	....	*†	†	....	*	*	St. Thomas..	
....	..	*†	†	....	....	†	....	†	†	....	....	Barbados....	Pliocene.
....	..	....	..	....	†	....	....	*	....	....	....	Jamaica....	
*	*	*†	..	....	....	*	....	*	....	....	....	Jamaica.....	Pliocene.
....	..	*†	..	....	†	....	....	†*	....	....	....	Barbados....	
....	..	*†	..	....	*	*	....	†*	....	....	....	Jamaica.....	
....	..	....	..	....	†	....	....	*†	....	....	....	Jamaica.....	
....	..	*	..	....	†*	....	....	†*	....	....	....	Venezuela...	
....	..	....	..	....	†	....	....	....	....	....	....	Gordon Key .	
....	..	*†	..	....	*	*	....	*	....	....	....	Haiti	
*	*	*	..	....	....	....	....	....	....	*	*	S. Carolina..	Pliocene.
*	*	*	*	*	*	*	....	†	....	*	*	Barbados....	Miocene.
....	..	....	..	....	*	*	....	....	....	....	....	Gulf of Mex .	
....	..	*	..	....	....	*	....	....	....	....	....	Gulf of Mex .	Pliocene.
....	..	*	..	....	....	....	....	*	*	....	....	Rio Janeiro..	
....	..	*†	..	....	....	*†	*	....	....	....	....	Texas.....	
*	*	*	..	....	....	....	....	....	....	....	....	Hatteras	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus SOLEN Linné.					
	Subgenus **Ensis** Schumacher.					
462	E. americana Gould	53 55	4 4, 5		0 2 8	Labrador
463	E. viridis Say					Rhode Island
	Suborder ENSIPHONACEA.					
	Family GASTROCHÆNIDÆ.					
	Genus GASTROCHÆNA Spengler.					
464	G. ovata Sowerby			30.0	0 2 7	Charleston
465	G. cuneiformis Spengler			25.0	0 2 3	Cape Fear
466	G. Stimpsonii Tryon			16.0		Beaufort
	Subgenus **Spengleria** Tryon.					
467	S. rostrata Spengler					W. Florida
	Suborder ADESMACEA.					
	Family PHOLADIDÆ.					
	Genus PHOLAS Linné.					
468	P. Campechiensis Gmelin					Hatteras
	Subgenus Barnea Leach.					
469	B. costata Linné	68	9			Cape Cod
470	B. maritima Orbigny					Texas
471	B. truncata Say	59	12			Nahant
	Genus ZIRPHÆA Leach.					
472	Z. crispata Linné	68	10		9	Arctic Sea

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
*	*	*	*	*	*	*	---	----	----	----	----	Florida Keys	
*	*	*	*	...	----	*	..	----	----	----	----	Sarasota	
----	..	*	..	----	*	*	...	*	----	...	*	St. Thomas ..	
----	..	*	..	..	*	*	----	*	*	----	----	Guadalupe ..	
----	..	*	..	..	----	----	----	..	----	----	----	----------	
----	..	----	..	----	*	*	----	*	----	----	----	St. Thomas ..	
---	..	*	*	*	*	*	*	*	----	----	----	Cent. America	Pliocene.
*		*	*	*	*	*	*	*	..	*	----	S. America...	Pliocene.
...		----	..	..	----	*	*	*	----	----	----	----------	
*	*	*	..	----	*	*	----	----	----	----	*	----------	
*	..	*	..	----	----	----	----	----	...	*	*	S. Carolina ?.	Pliocene.
----	..	*	.	..	----	----	----	----	----	----	----	S. Carolina ..	
†	..	----	..	----	----	----	----	†	----	----	----	St. Lucia....	
†	..	----	.	...	----	----	----	----	----	(*	----	Delaware ?..	
?	*	*	*	*	*	*	*	*	----	...	----	Trinidad	
----	..	----	..	----	*	*	*	*	*	*	?	N. Grenada...	
----	..	----	..	----	*	*	----	*	----	----	----	Guadalupe ..	
*	*	*	..	----	----	*	----	----	----	----	----	Manatee R...	

TABLE II. B.—*List of Pelecypoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family TEREDIDÆ.					
	Genus TEREDO Linné.					
480	T. norvegica Spengler	68	2	.....	.....	New York...
481	T. navalis Linné	55	6	.....	.....	Arctic Sea...
		59	2			
482	T. megotara Hanley	59	3	.....	.....	Arctic Sea...
		65	127			
483	T. Thomsoni Tryon	59	4	.....	.....	Cape Cod ...
484	T. dilatata Stimpson	68	1	.....	.....	Cape Ann...
	Subgenus Lyrodes Gould.					
485	L. chlorotica Gould	68	3	.....	.....	Mass. Bay ...
	Genus XYLOTRYA Leach.					
486	X. fimbriata Jeffreys	59	1	.....	.....	Rhode Island
487	X. bipinnata Jeffreys	....	.....	.....	.....	N. Atlantic..

TABLE II. B.—*List of Pelecypoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time
*	--	----	--	----	----	*	----	----	----	*	----	Manatee	
*	--	----	--	----	----	*	*	----	----	*	----	Florida	
*†	*	*	--	----	----	----	----	----	----	*	----	S. Carolina ..	P. Pliocene.
*	--	----	--	----	*	*	----	----	----	----	----	?	
-	*	*	--	----	----	----	----	----	----	----	----	S. Carolina ? .	
*	--	----	--	----	----	*	----	----	----	----	----	Gulf of Mex.	
*	*	*	*	----	*	*	*	----	----	*	*	Gulf of Mex.	
----	--	----	--	----	----	*	----	*	----	*	----	St. Vincent..	

TABLE III. C.—*List of Scaphopoda.*

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range
	Class SCAPHOPODA.					
	Order SOLENOCONCHIA.					
	Family DENTALIIDÆ.					
	Genus DENTALIUM Linné.					
1	D. agile Sars	....	......	......	400	Norway .....
2	D. perlongum Dall	27	6	80. 0	227/1191	Hatteras ....
3	D. filum Sowerby	....	......	......	17/1093	Scotland ....
4	D. callipeplum Dall	27	12*b*	61. 5	16/175	S. Carolina ..
5	D. matara Dall	....	......	41. 0	16/111	C. Lookout ..
6	D. leptum Bush	41	18*a*	31. 5	12/82	Hatteras ....
7	D. antillarum Orbigny	....	......	......	17/1067	Nova Scotia.
8	D. calamus Dall	....	......	19. 5	4	Turtle Harb .
9	D. taphrium Dall	....	......	17. 0	22/182	Hatteras ....
10	D. candidum Jeffreys	46	16, 17	90. 0	410/1780	N. Atlantic ..
11	D. sericatum Dall	26	1	13. 0	640	Gulf of Mex.
12	D. carduus Dall	27	3	87. 0	116/338	Florida Str..
13	D. disparile Orbigny	....	......	......	2/100	Tampa ......
14	D. ceratum Dall	26 27	5 2	30. 0	50/1097	Gulf of Mex.
15	D. Gouldii Dall	26	4	28. 0	12/140	S. Carolina ..
16	D. platamodes Watson	....	......	......	390/430	Florida Str..
17	D. ceras Watson	....	......	......	102/1568	Gulf of Mex.
18	D. capillosum Jeffreys	....	......	......	119/1500	N. Atlantic ..
19	D. laqueatum Verrill	27 46	1 18	45. 0	60/200	Chesapeake .
20	D. compressum Watson	....	......	......	111/500	Cedar Keys..

[redacted]

TABLE III. C.—*List of Scaphopoda.*

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern. extreme range.	Range in time.
....	..	....	..	....	†	....	....	†	....	†	....	Florida Str..	
....	..	†	..	†	†	†	....	†	....	....	....	St. Vincent..	
....	..	†*	..	....	....	....	....	....	....	†	....	Cape Fear ...	Pliocene.
....	..	†		....	....	†	....	†	....	....	....	Grenada.....	
....	..	*		....	....	†*	....	*	....	....	....	Haiti	
....	..	*		....	*	*	....	....	....	....	....	C. Romano ..	
....	..	†		....	†	†	*	†	....	....	....	Barbados....	
....	..	....		....	*	...	....	....	....	....	....	Florida Str..	
....	..	*		....	†	*	....	†	....	....	....	Cuba.....	
†	†	†		....	....	....	....	....	....	....	....	Cape Fear...	
....	..	....		....	....	..	†	†	....	....	....	Yucatan.....	
....	..	....	..	†	....	....	*	†	....	....	....	Grenada	
....	..	....	..	....	*	*	....	*	....	....	....	Barbados....	
....	..	....	..	....	†	†	....	†	....	....	....	Barbados....	
....	..	*	..	....	†	....	....	*	....	....	....	Aspinwall...	
....	..	....	..	†	....	....	....	†	....	....	....	Culebra	
....	..	....	..	....	....	†	....	†	....	....	†	Martinique..	
....	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	†	†	..	....	†	†	....	†	....	....	....	Grenada	
....	..	....	..	....	†	†	....	†	....	....	....	Culebra	
....	..	....	..	....	†	†	....	†	....	....	....	Barbados....	
....	..	†	..	....	†	†	....	†	....	....	....	Grenada.....	
†	†	....	†	....	†	....	....	†	....	†	....	Barbados....	
†	..	†	..	....	....	....	....	....	....	†	....	Hatteras	
....	..	*	*	....	....	*	....	....	....	....	....	West Florida	
....	..	*	..	....	....	....	....	....	....	....	....	.....	
†	..	....	..	....	....	....	....	....	....	†	....	Rhode Island	
....	..	....	..	....	†	....	....	....	....	....	....	Florida Str..	
†	†	....	..	....	....	....	....	†	....	....	....	St. Vincent..	
†	..	†	..	....	....	....	....	....	....	....	....	Hatteras	
....	..	....	..	....	....	....	†	†	....	....	....	St. Vincent..	
....	..	....	..	....	....	....	†	†	....	....	....	Old Provid'ce	
†	..	†	..	....	....	....	....	†	....	†	....	Barbados....	

TABLE III. C.—*List of Scaphopoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus CADULUS—Continued.					
34	C. carolinensis Bush	41	19	9.5	15/361	Hatteras
35	C. Agassizii Dall	27	12*c*	9.0	229	Florida Str.
36	C. Pandionis Verrili	64	126		17/300	Rhode Island
37	C. lunula Dall	27	8	6.0	18/405	C. Lookout
38	C. obesus Watson				220/350	Florida Str.
39	C. amiantus Dall	27	7	5.75	8/1000	Cape Florida
40	C. cucurbita Dall	27	12*d*	4.0	214/310	Fernandina
41	C. gracilis Jeffreys				220/343	N. Atlantic
42	*C. acus* Dall	27	11	8.0	30	
43	C				731	Hatteras
44	C. minusculus Dall			2.2	63/394	Hatteras

TABLE III. C.—*List of Scaphopoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*			....	....	....	†	....	....	....	Old Provid'ce	
....	..				†	....	....	†			....	Cuba.....	
....					....	....	....	....			....	Florida Str..	
...					†	....	....	†			....	Barbados....	
...					†	....	....	†			....	St. Thomas..	
...					*	....	....	†	....	....	....	Cuba	
...					†	....	....	†	....	....	....	Florida Str..	
...					....	....	....	....	....	†	....	Hatteras	
...					....	....	....	†	....	....	....	Haiti	
...			†		....	....	....	....	....	....	....	Fernandina .	
....	..		†	....	....	....	....	....	....	....	....	Fernandina .	

TABLE IV. D.—*List of Pteropoda.*

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Order PTEROPODA.					
	Suborder THECOSOMATA.					
	Genus LIMACINA Cuvier.					
	Section HETEROFUSUS Fleming.					
1	L. trochiformis Soul	....	.....	1.0	Pelagic	N. lat. 42° ..
2	L. bulimoides Orb	....	.....	2.0	Pelagic	N. lat. 35° ..
3	L. Lesueuri Orb	....	.....	1.5	Pelagic	N. lat. 38° ..
4	*L. retroversa* Flem	....	.....	2.5	Pelagic	Arctic Sea .
	Section LIMACINA s. s.					
5	L. helicina Phipps	48	14	3.0	Pelagic	Arctic Sea .
	Subgenus **Embolus** Jeffreys.					
6	E. inflatus Orbigny	....	.....	1.5	Pelagic	N. lat. 42° ..
7	E. triacanthus Fischer	....	.....	4.5	Pelagic	N. lat. 38° ..
	Genus PERACLE Forbes.					
8	P. reticulata Orbigny	....	.....	4.0	Pelagic	N. lat. 37° ..
9	var. diversa Monterosato	....	.....	7.5	Pelagic	N. lat. 31° ..
10	*P. ? helicoides* Jeffreys	....	.....	10.0	Pelagic	N. lat. 57° ..
	Family CAVOLINIIDÆ.					
	Genus CRESEIS Rang.					
11	C. virgula Rang	....	.....	6.0	Pelagic	N. lat. 41° ..
12	C. conica Eschscholtz	66	112	7.0	Pelagic	N. Atlantic
13	C. recta Blainville	66	118	25.0	Pelagic	N. lat. 48° ..
	Section BOASIA Dall.					

TABLE IV. D.—*List of Pteropoda.*

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
*	*	*	*	*	*	.....	....	*	*	*	?	S. lat. 28°	
....	*	*	*	*	*	.....	....	*	*	*	?	S. lat. 48°	P. Pliocene.
*	*	*	*	*	*	.....	....	*	*	*	*	S. lat. 36°	P. Pliocene.
....	....	....	....	....	....	.....	.....	.....	.....	*	.....	N. lat. 40° ...	P. Pliocene.
....	....	....	....	....	....	.....	.....	.....	.....	*	*	N. lat. 35° ...	
*	....	....	*	....	.....	*	....	*	*	*	*	S. lat. 40°	P. Pliocene.
....	....	....	*	....	.....	.....	....	*	*	*	.....	N. lat. 18° ...	Pliocene.
....	....	....	*	*	*	*	....	*	*	*	?	S. lat. 9°	P. Pliocene.
....	....	....	*	*	*	.....	....	*	*	*	....	N. lat. 28° ...	Pliocene.
....	....	....	?	....	.....	.....	....	.....	....	*	.....	N. lat. 31° ...	P. Pliocene.
*	*	*	*	*	*	*	....	*	*	*	*	S. lat. 35°	P. Pliocene.
*	*	*	*	....	.....	.....	....	.....	.....	*	*	Equator.....	P. Pliocene.
....	*	*	*	*	*	.....	....	*	*	*	?	S. lat. 40°	P. Pliocene.
....	....	....	*	....	.....	.....	....	.....	....	*	.....	N. lat. 8°	
*	....	....	*	*	.....	.....	....	*	*	*	?	S. lat. 40°	P. Pliocene.
*	*	*	*	*	*	*	*	*	*	*	*	S. lat. 40°	P. Pliocene.
*	*	*	*	*	*	*	*	*	*	*	?	S. lat. 40°	P. Pliocene.
*	*	*	*	*	*	.....	....	.....	....	*	?	S. lat. 42°	P. Pliocene.

TABLE IV. D.—*List of Pteropoda*—Continued.

Ser. No	Name and authority for species.	Pl.	Figs.	Alt or Lon.	Range in depth.	Northern extreme range.
	Section BALANTIUM Benson.					
19	C. recurva Children	....	.....	28.0	.....	N. lat. 40°..
20	C. falcata Pfeffer	....	.....	10.0	Pelagic	Davis Str..
	Genus CUVIERINA Boas.					
21	C. columnella Rang	66	117	12.0	Pelagic	N. lat. 43°..
	Genus CAVOLINIA Abild.					
	Section DIACRIA Gray.					
22	C. trispinosa Lesueur	66	115	11.0	Pelagic	N. lat. 60°..
22*a*	?C. Hargeri Verrill	....	.....	.....	.....	Geo. Bks...
	Section CAVOLINIA s. s.					
23	C. quadridentata Lesueur	....	.....	4.0	Pelagic	N. lat. 40°..
24	C. longirostris Lesueur	....	.....	7.0	Pelagic	N. lat. 47°..
25	C. gibbosa Rang	....	.....	11.0	Pelagic	N. lat. 43°..
26	C. tridentata Forskäl	66	113	18.0	Pelagic	N. lat. 40°..
27	C. uncinata Rang	66	116	7.0	Pelagic	N. lat. 40°..
28	C. inflexa Lesueur	...	.....	7.0	Pelagic	N. lat. 42°..
	Family CYMBULIIDÆ.					
	Genus COROLLA Dall.					
	(Cymbulicpsis Pelseneer.)					
29	*C. calceola* Verrill	66	120	45.0	Pelagic	N. lat. 40°..
	Suborder GYMNOSOMATA.					
	Family CLIONIDÆ.					
	[redacted]					

TABLE IV. D.—*List of Pteropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
*	....	....	*	*	*	*	....	*	....	....	.....	S. lat. 33°	P. Pliocene.
?	....	....	?	.....	.....	.....	?	.....	?	*	.....	Brazil.....	
*	*	*	*	*	*	*	*	*	*	*	?	S. lat. 40°	P. Pliocene.
....	*	*	*	*	*	*	....	*	*	*	*	S. lat. 40°	P. Pliocene.
....	..	*	...	*	....	.....	....	*	....	....	.....	Bahamas	
*	*	*	*	*	*	.....	....	*	*	*	*	S. lat. 17° ...	P. Pliocene.
*	*	*	*	*	*	.....	....	*	*	*	?	S lat. 40° ...	P. Pliocene.
*	*	*	*	*	*	.....	....	*	*	*	*	S. lat. 41 ...	P. Pliocene.
*	*	*	*	*	*	.....	....	*	*	*	*	S. lat. 40° ...	P. Pliocene.
*	...	....	*	*	*	*	....	*	....	*	*	S. lat. 40° ...	P. Pliocene.
*	..	....	*	*	*	*	....	*	*	*	*	S. lat. 42° ...	P. Pliocene.
*	...	....	...	....	.....	.....	....	.....	....	....	.....	.....	
*	*	....	..	....	.....	....	....	.....	...	*	*	N. lat. 37° ...	
*	*	*	...	....	.....	.....	....	....	....	....	...	China Sea...	
*	*	*	...	....	.....	.....	....	?	?	?	....	.....	
*	...	....	...	....	....	.....	....	....	*	*	.....	S. lat. 15 ..	

TABLE V. E.—*List of Gastropoda.*

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Class GASTROPODA.					
	Subclass ANISOPLEURA.					
	Superorder EUTHYNEURA.					
	[**Order PTEROPODA.** *See* separate table.]					
	Order OPISTHOBRANCHIATA.					
	Suborder TECTIBRANCHIATA.					
	Family ACTÆONIDÆ.					
	Genus ACTÆON Montfort.					
1	A. exilis Jeffreys	....	.....	.....	150/456	N. Atlantic ..
2	A. pusillus Forbes	....	.....	.....	111/450	N. Atlantic .
3	A. punctostriatus C. B. Adams	41 52	17 22	.....	7/63	Cape Cod ....
4	A. Cumingi A. Adams	....	.....	.....	.....	Cape Fear...
5	A. delicatus Dall	17	5	10.0	13/400	Gulf of Mex.
6	A. melampoides Dall	17 46	2 15	6.0 8.0	310/2674	Virginia ....
7	A. perforatus Dall	18	3	7.75	339	Florida Str.
8	A. Danaida Dall	17	12	11.0	339	Tortugas....
9	A. incisus Dall	17	1, 1*b*	9.0	204/840	Fernandina .
	Genus OVULACTÆON Dall.					
10	O. Meekii Dall	33	3, 4	5.5	300/400	Fernandina .
	Family RINGICULIDÆ.					
	Genus RINGICULA Deshayes.					

TABLE V. E.—*List of Gastropoda.*

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
†	..	....	..	†	....	....	....	†	....	†	....	Campeche....	Pliocene.
....	..	....	..	....	†	†	....	†	....	†	....	Havana.....	
....	..	†*	..	*	*	*	....	*	....	....	....	Haiti	P. Pliocene.
....	..	....	..	....	*	....	....	*	....	....	....	Rio	
....	..	....	..	....	†	*	....	†	....	....	....	Barbados....	
....	†	†	..	....	†	....	....	†	....	....	....	Cuba.....	
....	..	....	..	....	††	....	....	†	....	....	....	Cuba.....	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba.....	
....	..	....	†	....	....	....	†	†	....	....	....	Yucatan.....	
....	..	....	†	....	....	....	....	†			....	Bahamas	
....	..	....	†	....	*†	†	....	†	†	†	....	Brazil.....	Pliocene.
....	..	†	..	....	....	....	....	*	....	....	....	Jamaica	
....	..	....	..	....	*	....	....	*	....	....	....	Trinidad	
....	..	....	..	....	*	*	....	*	....	....	....	Jamaica	
*	..	*	*	*	*	*	....	*	....	....	....	Haiti	Pliocene.
....	..	*	..	....	*	*	....	*	....	....	....	Martinique..	
....	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	†	..	*	*	....	....	....	....	....	....	Florida Keys	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Subgenus **Cylichnella** Gabb.					
19	C. bidentata Orbigny	41	14	.....	$\frac{7}{168}$	Hatteras ....
20	C. oryza Totten	52	23	3.07	.....	Cape Cod ....
	Genus UTRICULUS Brown.					
21	U. Frielei Dall	17	4	8.2	$\frac{100}{640}$	Gulf of Mex.
22	U. vortex Dall	17 44	3 15	7.5 10.0	$\frac{266}{839}$	Rhode Island
23	*U. domitus* Dall	17	8	9.0	$\frac{382}{1891}$	.....
	Subgenus **Retusa** Brown.					
24	R. Gouldii Couthouy	72	7	3.0	$\frac{5}{22}$	Maine .....
25	R. pertenuis Mighels	52 72	25, 26 6	2.7	$\frac{10}{294}$	Norway .....
26	R. sulcata Orbigny	....	.....	.....	$\frac{14}{31}$	Hatteras ....
27	R. ovata Jeffreys	....	.....	.....	$\frac{37}{1000}$	N. Atlantic..
28	R. obesiuscula Brugnone	....	.....	.....	$\frac{63}{168}$	Rhode Island
29	R. cælata Bush	41	15	3.0	$\frac{15}{294}$	Hatteras ....
	Genus VOLVULA A. Adams.					
30	V. acuta Orbigny	41	11	2.5	$\frac{15}{63}$	Hatteras ....
31	V. oxytata Bush	41	12	4.0	$\frac{5}{64}$	Hatteras ....
32	V. Bushii Dall	....	.....	4.6	124	Hatteras ....
33	V. aspinosa Dall	....	.....	4.0	$\frac{18}{200}$	Hatteras ....
	Family SCAPHANDRIDÆ.					
	Genus SCAPHANDER Montfort.					
34	S. punctostriatus Mighels	72	4	.....	$\frac{45}{1407}$	Norway .....
35	S. Watsonii Dall	17	10	8.75	54	Hatteras ....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*†	..	....	*	*	*	*†	....	....	....	Barbados....	Pliocene.
*	*	*	..	....	....	....	....	....	....	....	....	Charleston ..	P. Pliocene.
....	..	....	..	....	....	....	†	†	....	....	....	Barbados....	
?	..	....	..	†	†	....	....	†	....	....	....	Cuba.....	
....	..	....	..	....	....	....	....	†	....	....	....	Guadalupe ..	
?	..	†	..	....	....	....	....	....	....	....	....	Hatteras	
*	..	....	†	....	....	....	....	....	....	*	....	Fernandina .	
..	..	*	..	....	....	....	....	*	....	....	....	Guadalupe ..	
....	..	†	..	†	*	....	....	*†	....	*†	....	Brazil	
†	..	†	..	....	....	....	....	....	....	†	....	Hatteras	Pliocene.
..	..	†*	†	....	....	....	....	....	....	....	....	Fernandina .	
....	..	*†	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	†*	..	....	....	....	....	?	....	*	....	Cape Fear...	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	*†	†	†	....	....	....	....	....	....	....	Florida Str..	
†	†	†	†	†	†	†	....	†	....	†	....	Barbados....	
....	..	†	..	....	†	†	....	†	....	....	....	Barbados....	
†	†	....	..	....	....	†	....	†	....	....	....	Jamaica.....	? Miocene.
....	..	....	†	....	....	†	†	†	....	....	....	Guadalupe ..	
....	..	*	..	....	*†	....	....	*	....	....	....	Santa Cruz..	
....	..	*	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	†*	†	....	....	....	....	....	....	....	....	Fernandina .	
?*	..	....	..	....	....	....	....	?	....	*	*	St. Thomas?.	P. Pliocene.
*	..	....	..	....	....	....	....	....	....	*	....	.....	P. Pliocene.

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family APLUSTRIDÆ.					
	Genus APLUSTRUM Schum.					
	Subgenus **Hydatina** Schum.					
43	H. physis Linné	....	.....	.....	.....	Sarasota.....
	Subgenus **Bullina** Férussac.					
44	B. undata Bruguière	....	.....	.....	.....	Florida Keys.
	Family BULLIDÆ.					
	Genus BULLA Linné.					
45	B. striata Bruguière	....	.....	.....	.....	Texas.....
46	B. solida Gmelin	....	.....	.....	.....	Florida Keys.
47	B. occidentalis A. Adams	....	.....	.....	.....	Tampa.....
48	B. eburnea Dall	17	6	7.25	$\frac{107}{339}$	Hatteras ....
49	B. abyssicola Dall	17	11	12.7	$\frac{339}{1181}$	Ireland .....
	Genus HAMINEA Leach.					
50	H. succinea Conrad	....	.....	.....	$\frac{9}{170}$	Texas.....
51	H. solitaria Say	52	20	10.0	.....	Mass. Bay ..
52	H. antillarum Orbigny	...	.....	.....	.....	Tampa.....
53	H. Guildingi Swainson	....	.....	.....	.....	Texas.....
54	H. Petitii Orbigny	....	.....	.....	.....	Tampa.....
	Genus CYLINDROBULLA Fischer.					
55	C. Beani Fischer	....	.....	.....	$\frac{2}{98}$	Cedar Keys..
	Family PHILINIDÆ.					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	*	*	....	*	*	....	....	Guadalupe ..	
....	..	....	..	....	*	....	....	*	....	....	....	Tortola.....	
											*		
....	..	....	..	*	*	*	*	*	*	....	....	Barbados....	Pliocene.
....	..	....	..	....	*	....	*	*	....	....	....	Barbados....	
....	..	....	..	....	*	*	....	*	*	....	....	St. Vincent..	
....	..	†	†	....	†	....	....	†	....	....	....	Cuba.....	
....	..	....	..	†	†	†	....	†	....	†	....	Santa Cruz..	
....	..	....	..	....	*	*	*	†	....	....	....	Grenada.....	
....	..	*	*	....	....	....	....	....	....	....	....	Georgia	
....	..	....	..	....	*	*	....	*	....	....	....	Guadalupe ..	
....	..	....	..	....	*	*	*	*	....	....	....	Rio Janeiro .	
....	..	....	..	....	†	*	....	*	....	....	....	St. Thomas..	
....	..	....	..	....	*	†	....	*	....	....	....	Guadalupe ..	
....	..	*	..	....	....	....	....	*	....	....	....	Martinique..	
....	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	*	....	....	....	....	*	....	Marco.	
†	..	....	..	....	....	....	....	....	....	....	....	Delaware....	
....	..	†	..	....	....	....	....	....	....	....	....	C. Lookout..	
....	..	....	..	....	....	....	†	†	....	†	....	Yucatan.....	
....	..	....	..	†	....	....	....	†	....	†	....	Guadalupe ..	
....	..	....	..	....	*	....	....	*	*	....	....	Florida Str..	Pliocene.

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus HYALOPATINA Dall.					
64	H. Rushii Dall	....	.....	9.3	.....	Florida Str..
	Superfamily ANASPIDEA.					
	Family APLYSIIDÆ.					
	Genus APLYSIA Linné.					
65	A. protea Rang	....	.....	.....	.....	St. Augustine
66	A. Willcoxii Heilprin	....	.....	200.0	.....	Gasparilla...
	Superfamily NOTASPIDEA.					
	Family PLEUROBRANCHIDÆ.					
	Genus PLEUROBRANCHUS Cuvier.					
67	*P. americanus* Verrill	46	13	13.5	250	Rhode Island
	Genus PLEUROBRANCHÆA Meckel.					
68	P. tarda Verrill	....	.....	.....	$\frac{38}{640}$	Rhode Island
	Genus KOONSIA Verrill.					
69	K. obesa Verrill	43	7	128.0	$\frac{193}{312}$	Rhode Island
	Order NUDIBRANCHIATA. [Omitted.]					
	Order PULMONATA.					
	Suborder STYLOMMATOPHORA.					
	Superfamily DITREMATA.					
	Family ONCHIDIIDÆ.					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
			*					*				Bahamas	
			*		*	*		*	*			N. Grenada	
						*							
††													
*†	†											Chesapeake	
*†												Delaware	
					*				?			Florida Keys.	
					*	*						Florida Keys.	
					*	*		*				Demerara	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus TRALIA Gray.					
73	T. pusilla Gmelin	47	5	21.0	.....	Cedar Keys..
74	T. minuscula Dall	....	.....	.....	.....	Tampa .....
	Subgenus **Alexia** Gray.					
75	A. myosotis Draparnaud	52	9	.....	.....	England ...
	Subfamily MELAMPINÆ.					
	Genus PEDIPES (Adans.) Blainv.					
76	P. mirabilis Muhlfeldt	47	17	3.6	....	Tampa .....
77	P. elongatus Dall	47	4	4.0	.....	Marco, Fla ..
	Genus MELAMPUS Mtf.					
78	M. coffeus Linné	47	3	.....	....	Cedar Keys..
79	M. floridanus Shuttleworth	47	2	.....	.....	Tampa .....
80	M. flavus Gmelin	47	1	12.0	.....	Cedar Keys..
81	M. lineatus Say	47	9, 12	.....	.....	Mass Bay...
	Subgenus **Leuconia** Gray.					
82	L. bidentata Montagu	47	13	.....	.....	Shetland ....
	Subgenus **Detracia** Gray.					
83	D. bulloides Montagu	47	7	11.0	.....	Cedar Keys..
	Subgenus **Sayella** Dall.					
84	S. Hemphillii Dall	47	11	3.7	.....	Cedar Keys..
85	S. Crosseana Dall	47	10	2.5	.....	Egmont Key.
86	S. ——	....	.....	.....	.....	Tampa .....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	*	*	....	*	*	....	....	Guadalupe ..	
....	..	....	..	....	*	*	....	*	....	....	....	Bahamas	
*	..	*	..	...	....	*	....	*	....	*	*	Jamaica	
....	..	....	..	....	*	*	....	*	*	....	....	Guadalupe ..	
....	..	....	..	....	*	....	....	....	....	....	....	.....	
....	..	....	..	....	*	*	*	*	....	....	....	Cayenne	P. Pliocene.
....	..	....	..	...	*	*	....	....	....	....	....	Florida Keys	
....	..	....	..	....	*	*	....	*	....	....	*	Guadalupe ..	
*	*	*	*	*	*	*	*	*	....	....	....	Tortola	
?	..	?	..	....	....	....	....	....	....	*	....	S. Carolina ?.	
....	..	....	..	....	*	*	....	*	....	....	....	Antilles	
....	..	....	..	....	....	*	...	....	....	....	....	.....	
....	..	....	..	....	....	*	....	*	....	....	...	Bahamas	
....	..	...	..	..	....	*	...	*	....	....	....	Bahamas	
....	..	....	..	....	*	*	....	*	....	*	....	Porto Rico ..	
....	..	...	..	*	*		....	....	*	....	....	Florida Keys	
....	..	....	*	*	*	....	*	*	....	?	....	Brazil.....	
....	..	....	..	....	*	*	....	*	....	....	....	Barbados....	
....	..	....	..	....	?	....	....	*	*	....	....	Colon	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Superorder STREPTONEURA.					
	Order CTENOBRANCHIATA.					
	Suborder ORTHODONTA.					
	Superfamily TOXOGLOSSA.					
	Family TEREBRIDÆ.					
	Genus TEREBRA Bruguière.					
	Section HASTULA H. & A. Adams.					
92	T. hastata Gmelin	....	.....	.....	....	Key West...
93	T. cinerea Gmelin	....	.....	.....	.....	Texas.....
	Section SUBULA Schumacher.					
94	T. floridana Dall	....	.....	70.0	$\frac{16}{36}$	Key West...
	Section ACUS H. & A. Adams.					
95	T. dislocata Say	....	....	57.0	.....	Maryland...
96	T. concava Say	....	.....	19.0	.....	Hatteras....
97	var. vinosa Dall	....	.....	18.0	.....	Hatteras....
98	T. protexta Conrad	....	.....	21.2	$\frac{3}{40}$	Hatteras....
99	var. lutescens Smith	....	.....	15.5	.....	Cape Fear...
100	T. nassula Dall	36	8	55.0	$\frac{54}{640}$	Gulf of Mex.
101	T. limatula Dall	....	.....	18.0	$\frac{33}{200}$	C. Lookout..
102	T. benthalis Dall	29	6	21.0	$\frac{109}{400}$	Fernandina .
103	T. Rushii Dall	....	.....	15.0	8	Florida Keys
	Family CONIDÆ.					
	Genus CONUS Linné.					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Ber-mu-da.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	*	....	....	*	*	....	....	Tortola	
....	..	....	..	....	....	....	*	*	....	....	....	Barbados....	
....	..	....	..	....	†*	....	....	....	....	....	....	Florida Str..	
....	..	*	*	*	*	*	*	*	....	....	....	Venezuela ...	Pliocene.
....	..	*	*	....	....	....	....	....	....	....	....	Georgia	Plioceno.
....	..	*	*	....	....	*	....	....	....	....	....	W. Florida ..	
....	..	*	*	*	....	*	*	....	....	....	....	Texas	Pliocene.
....	..	*	..	....	....	*	....	....	....	....	....	W. Florida ..	
....	..	....	..	....	....	†	....	†	....	....	....	Martinique ..	
....	..	*	..	†	†	†	....	†	....	....	....	Barbados....	
....	..	....	..	†	†	....	....	†	....	....	....	Havana	
....	..	....	..	....	*	....	....	....	....	....	....	Cape Florida.	
....	..	....	..	*	*	*	....	*	....	....	....	Venezuela ...	Pliocene.
....	..	....	..	....	....	*	....	*	....	....	....	Santa Cruz ..	
....	..	†*	..	....	*	*†	....	....	....	*	....	Florida Keys	
....	..	†	..	....	*	*	....	†*	....	....	...	Barbados....	Pliocene.
....	..	*	..	*	*	*	....	....	....	....	....	Florida Keys	Pliocene.
....	..	....	..	....	....	....	....	†	*	....	....	Barbados....	
....	..	*	..	....	*	*	....	*	....	....	....	Darien	Plioceno.
....	..	....	..	....	*	*	....	*	....	....	....	Tobago......	Pliocene.
....	..	....	..	....	*	....	....	*	*	....	....	Brazil	
....	..	....	..	*	*	....	....	*	*	....	....	Swan Islands	
....	..	....	..	....	†	....	*	....	....	....	....	Yucatan.....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family PLEUROTOMIDÆ.					
	Genus PLEUROTOMA Lamarck.					
	Subgenus **Pleurotoma** s. s.					
115	P. albida Perry	....	......	......	$\frac{26}{100}$	Cedar Keys..
116	var. tellea Dall	....	......	100.0	$\frac{60}{115}$	W. Florida..
117	var. vibex Dall	....	......	19.0	$\frac{80}{180}$	Florida Keys
118	P. periscelida Dall	32	2	40.0	$\frac{197}{125}$	Hatteras ....
	Subgenus **Leucosyrinx** Dall.					
119	L. Verrillii Dall	10	5	36.0	$\frac{158}{940}$	Cape Fear...
120	L. Sigsbeei Dall	11	10	25.5	1591	Gulf of Mex
121	L. tenoceras Dall	36	5	60.0	$\frac{478}{724}$	Cape Fear...
122	L. subgrundifera Dall	38	1	30.0	$\frac{538}{940}$	Cape Fear...
	Subgenus **Ancistrosyrinx** Dall.					
123	A. elegans Dall	38	3	27.0	805	Florida Reefs
124	A. radiata Dall	12	12	18.0	$\frac{73}{640}$	Cedar Keys..
	Subgenus **Genota** Adams.					
125	G. mitrella Dall	12	5	12.5	$\frac{294}{640}$	Fernandina .
	Section DOLICHOTOMA Bellardi.					
126	G. viabrunnea Dall	13	2	38.0	$\frac{180}{357}$	South Cuba .
	Genus DRILLIA Gray.					
127	D. ostrearum Stearns	....	......	......	$\frac{15}{170}$	Hatteras ....
128	D. albicoma Dall	10	8	25.7	$\frac{84}{854}$	Gulf of Mex.
129	D. detecta Dall	12	11	11.7	$\frac{833}{990}$	Gulf of Mex.

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
						†*		†*				Barbados	Miocene.
						†						W. Florida	
					†			†				Saba, W. Ind.	
		†						†				Monosoquillo	
		†				†		†				Guadalupe	
							†	†				Bequia	
		†				†		†				Guadalupe	
		†		†		†		†				St. Kitt's	
					†			†				Cuba	
					†	*		†				Barbados	
			†					†				Yucatan	
								†				Barbados	
		*			*	*		†				Grenada	
						†		†				Barbados	
						†		†				Culebra	
		†				†						Gulf of Mex	Pliocene.
		†				†		†				Barbados	
								†				Yucatan	
								†				Grenada	
		†				†		†				Grenada	
							?	*				Yucatan	
					*			*				Costa Rica	
					*							Vera Cruz	Pliocene.
					*	*						Yucatan	Pliocene.
					*	*		*				St. Domingo	
					*	†						Gulf of Mex.	
						†		*				Grenada	
				†	†*	†		†				Barbados	
			†	†								East Florida	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
144	Drillia tristicha Dall	....	......	23.0	$\frac{1\,1}{2\,10}$	Cedar Keys..
145	D. ebur Reeve	....	......	......	$\frac{13}{60}$	Hatteras ....
146	D. fucata Reeve	....	......	......	$\frac{14}{60}$	Cape Fear...
147	var. paria Reeve	....	......	......	$\frac{13}{60}$	Cape Fear...
148	D. pagodula Dall	13	6	18.0	$\frac{50}{184}$	Florida Str..
149	var. pentagonalis Dall	....	......	7.0	49	Hatteras ....
150	D. thea Dall	48	1	15.0	$\frac{3}{16}$	Hatteras ....
151	var. carminura Dall	....	......	11.5	$\frac{100}{111}$	Gulf of Mex.
152	D. Simpsoni Dall	....	......	......	$\frac{5}{18}$	Hatteras ....
153	D. lissotropis Dall	11	3, 4	7.0	$\frac{73}{246}$	Gulf of Mex.
154	D. Dalli Verrill	60	66, *a*	19.5	$\frac{94}{146}$	Rhode Island
155	var. acloneta Dall	....	......	......	$\frac{170}{294}$	Georgia .....
156	var. cestrota Dall	....	......	......	196	Cedar Keys..
157	D. nucleata Dall	11	1	13.5	$\frac{54}{464}$	Cape Florida
158	D. Verrillii Dall	11	2	5.5	$\frac{220}{310}$	Gulf of Mex.
159	D. havanensis Dall	11	5	9.0	$\frac{268}{640}$	Florida Keys
160	D. premorra Dall	11	18	9.5	$\frac{100}{400}$	Fernandina .
161	D. oleacina Dall	11	8	10.0	$\frac{287}{340}$	Florida Str..
162	D. smirna Dall	11	7	15.0	$\frac{363}{413}$	Florida Str..
163	D. lithocolleta Watson	11	6	12.5	$\frac{407}{769}$	Hatteras ....
	Section CYMATOSYRINX Dall.					
164	D. centimata Dall	36	9	22.5	$\frac{731}{1920}$	Hatteras ....
165	D. æpynota Dall	36	10	15.0	$\frac{25}{126}$	Hatteras ....
166	D. Moseri Dall	36	3	30.0	$\frac{3}{50}$	Hatteras ....
167	D. ———	....	......	......	15	Florida Keys
168	D. ———	....	......	......	$\frac{294}{465}$	Georgia .....
169	D. ———	....	......	......	294	Georgia .....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	....	†	....	....	....	....	....	Gulf of Mex.	
....	..	*		....	†	†	...	†	....	....	....	Sombrero ...	
....	..	*		....	....	....	....	†	....	....	....	St. Thomas..	
....	..	*		....	....	....	....	†	....	....	....	Trinidad	
....	..	.		....	†	†	....	†	....	....	....	Barbados....	
....	..	†	..	....	*	....	....	....	....	....	....	Florida Keys	
....	..	*	*	....	*	*	....	....	....	....	....	Florida Keys	
....	..	.			....	†	....	†	....	....	....	Barbados....	
....	..				....	*	....	....	....	....	....	Tampa	
....	..	.			†	†	....	†	....	....	....	Barbados....	
†	..	.			....	....	....	....	....	....	....	Georgia	
....	..	.	†		....	....	....	†	....	....	....	Martinique..	
....	..	.			....	†	....	....	....	....	....	Gulf of Mex.	
....	..	.			†	....	....	†	....	....	....	Sombrero ...	
....	..	.			....	†	....	....	....	....	....	W. Florida ..	
....	..	.			†	....	....	†	....	....	....	Yucatan	
....	..	.			†	....	....	†	....	....	....	Havana	
....	..	.			†	....	....	†	....	....	....	Grenada	
....	..	.			†	....	....	†	....	....	....	Old Provid ..	
....	..	†			....	†	....	....	....	....	....	Cedar Keys..	
....	..				....	†	....	....	....	....	....	Cedar Keys..	
....	..				....	....	....	....	....	....	....	N. Carolina..	
....	..				*	*	....	....	....	....	....	Florida Keys	
....	..	....	..	....	†	....	....	....	....	....	....	Florida Keys	
....	..	....	†	†	....	....	....	....	....	....	....	Florida Str..	
....	..	....	†	....	....	....	....	....	....	....	....	Fernandina .	
....	..	....	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
†	..	†	..	....	....	....	....	....	....	†	....	Hatteras	
....	..	....	..	†	....	....	....	....	....	....	....	.....	
†	†	....	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
*	..	....	..	....	....	....	....	....	....	....	....	New York ...	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
179	Bela ———	....	.....	.....	300	Hatteras ....
180	B. subturgida Verrill	....	....	9.0	843	Hatteras ....
181	B. ———	....	.....	....	$\frac{63}{124}$	Hatteras ....
182	*B. Tanneri* Verrill	61	78	21.0	1290	Gulf of Maine
	Genus MANGILIA Risso.					
	Subgenus **Cythara** Schumacher.					
183	C. Bartlettii Dall	12 14	6 5,8	8.0 10.0	$\frac{0}{480}$	Key West ...
184	*C. cymella* Dall	12	4	12.5	$\frac{100}{220}$	Gulf of Mex .
	Subgenus **Daphnella** Hinds.					
185	D. limnæiformis Kiener	....	.....	.....	.....	Florida Keys
186	D. leucophlegma Dall	9	9	10.25	805	Gulf of Mex .
187	D. corbicula Dall	14	9	11.2	$\frac{40}{700}$	Hatteras ....
188	D. reticulosa Dall	10	10	11.5	$\frac{76}{294}$	Fernandina .
189	D. pompholyx Dall	36	4	12.5	$\frac{103}{294}$	Fernandina
190	D. retifera Dall	....	.....	6.5	$\frac{4}{63}$	Hatteras ....
191	D. morra Dall	12	1	5.75	$\frac{22}{430}$	C. Lookout ..
192	D. elata Dall	....	.....	4.75	$\frac{1}{22}$	Hatteras ....
	Section EUBELA Dall.					
193	D. limacina Dall	9	10	11.0	$\frac{85}{805}$	Rhode Island
194	D. calyx Dall	....	.....	.....	124	Hatteras ....
195	D. ———	....	.....	.....	805	Gulf of Mex .
196	D. sofia Dall	10	11	8.0	769	N. Carolina ?
197	var. hyperlissa Dall	....	.....	8.5	731	Hatteras ....
	Subgenus **Glyphostoma** Gabb.					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
††	..	....	..	....	....	....	....	....	....	....	....	George's B'ks	
....	..	....	..	....	*	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	*	....	....	*	....	....	....	Barbados....	
....	..	....	..	....	†	....	....	....	....	....	....	Gulf of Mex .	
....	..	†	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	....	†	....	....	....	....	†	....	....	....	Barbados....	Pliocene.
....	..	....	†	....	....	....	....	†	....	....	....	Barbados....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	*†	..	....	†	....	....	†	....	....	....	Cuba	
....	..	*	..	....	....	....	....	....	....	....	....	Cape Fear...	Pliocene.
....	..	...	†	†	†	†	†	†	....	....	....	Brazil.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba	
....	..	?†	..	....	....	....	....	†	....	....	....	Guadalupe ..	
....	..	†	..	..	....	....	....	†	....	....	....	.....	
....	..	....	..	....	*	....	....	....	....	....	....	.....	Miocene.
....	..	....	..	....	†	†*	....	†	....	....	....	Barbados....	Pliocene.
....	..	....	..	†	†	†	....	†	....	....	....	Old Provid'ce	
....	..	*	..	....	*	*	....	*	....	....	....	Barbados....	Pliocene.
....	..	*†	†	....	....	....	....	?	....	....	....	Martinique..	
....	..	*	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	*	*	....	....	....	....	....	Gulf of Mex .	
....	..	†*	..	....	*	*	....	*	....	....	....	Jamaica	
*	..	*	..	....	*	*	....	....	....	..	....	Florida Keys	Pliocene.
....	..	*	..	....	....	*	....	....	....	....	....	Charlotte H.	Pliocene.
*†	..	....	..	....	....	....	....	....	....	*†	*	Rhode Id....	
....	..	....	..	....	*	*	....	....	....	..	....	Key West ..	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range
210	Mangilia atrostyla Dall	41	4, 4*a*	8.75	$\frac{14}{343}$	Hatteras
211	M. limonitella Dall	48	3	7.1	$\frac{9}{8}$	Cedar Keys
212	M. cerina Kurtz & Stimpson	44	16, *a*	6.75	$\frac{3}{10}$	Cape Cod
213	M. ceroplasta Bush			5.5	$\frac{10}{17}$	Hatteras
214	M. cerinella Dall			11.8	$\frac{14}{22}$	Hatteras
215	M. quadrata Reeve			8.0		Hatteras
216	var. diminuta C. B. Adams					Hatteras
217	var. rugirima Dall					Florida Keys
218	var. *monocingulata* Dall	11	15, 16	6.75	100	
219	M. monilifera Sowerby					Florida Keys
220	*M. citronella* Dall	9	5	6.25	70	
221	M. ———					Hatteras
222	M. Dorvilliæ Gray					Florida Keys
223	M. ———				22	Hatteras
224	M. melanitica Dall					Hatteras
225	var. oxia Bush	41	3, 3*a*	5.0	$\frac{7}{46}$	Hatteras
226	M. ———				294	Fernandina
227	M. antonia Dall	10 11	4 11	5.75 7.0	$\frac{640}{769}$	Fernandina
228	M. serga Dall	9	4	9.0	$\frac{382}{1075}$	Florida Str.
229	M. peripla Dall	11	17	8.0	$\frac{640}{1000}$	Gulf of Mex.
230	M. elusiva Dall	12	7	9.25	$\frac{320}{640}$	Gulf of Mex.
231	M. bandella Dall	10 60	3 73	9.4 11.0	$\frac{351}{2100}$	Gulf of Maine
232	M. comatotropis Dall	11 44 61	12 8 77	6.0	$\frac{50}{1075}$	Rhode Island
233	M. scipio Dall	10	12	14.0	$\frac{128}{982}$	Fernandina

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Ber-mu-da.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*	*	...	*	*	....	†	....	....	...	Barbados....	
....	..	....	..	....	....	*	....	....	....	....	....	Tampa.....	
*	..	*	*	....	....	....	....	....	....	....	....	Fernandina .	P. Pliocene.
....	..	*	..	....	....	....	....	....	....	....	....	.....	
....	..	*	..	....	*	*	*	....	....	....	....	Texas.....	
....	..	*	..	....	*	....	*	*	...	....	....	Yucatan.....	
....	..	*	..	....	*	*	....	....	....	....	....	Florida Keys.	
....	..	....	..	....	*	....	....	....	....	....	....	.....	
....	..	....	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	*	....	....	*	....	....	....	St. Thomas..	
....	..	....	..	....	....	....	....	†	....	....	....	Sombrero....	
....	..	†	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	*	....	....	*	....	....	....	Haiti	
....	..	*	..	....	....	....	....	....	....	....	....	.....	
....	..	*	..	....	*	*	....	*	....	....	....	Haiti	
....	..	*	..	....	....	....	....	....	....	....	....	....	
....	..	....	†	....	....	....	....	....	....	....	....	.....	
....	..	....	†	...	....	†	....	†	....	...	....	Guadalupe ..	
....	..	....	..	†	....	....	....	†	†	....	....	Old Provid'ce	
....	..	....	..	....	....	....	*	*	....	....	....	Yucatan.....	
....	..	....	..	....	....	....	*	†	....	....	....	Culebra	
†	..	...	..	....	....	†	...	†	...	....	....	Bequia.....	
....	..	†	..	†	....	†	....	†	†	....	....	Barbados....	
....	..	....	†	....	....	....	....	†	....	....	....	St. Vincent ..	
....	..	....	..	....	....	†	...	....	....	....	....	Cuba.....	
....	..	....	..	....	....	†	....	†	...	....	....	Santa Cruz .	
...	..	....	†	†	....	....	...	....	....	..	....	Florida Sr	P. Pliocene.
....	..	....	..		....	†	....	†	....	....	....	Cuba.....	
..	..	....	†		....	....	...	†	...	...	....	Dominica	
....	..	....			....	....	....	....	....	....	....	Rhode Island	
....	..	†	.	..	....	....	...	....	....	..	..	Hatteras ..	
....	..	...	..		....	†	..	†	.	..	....	Bequia ...	
††	..	....	..	..	....	....							
....	..	....	.	....	†	†		†				Florida S	
†	..	†	..	.....	...	...	....	..	.	.		Ha teras	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
245	Pleurotomella Agassizii V. & S.	60	67, 71	31.0	30/1608	Rhode Island
246	var. Sandersoni Verrill	....	.....	.....	1709/2033	Gulf of Maine
247	var. mexicana Dall	11	14	8.5	502/640	Gulf of Mex.
248	*P. Edgariana* Dall	36	6	58.0	205	.....
249	*P. Pandionis* Verrill	60	69	43.0	338/339	Rhode Island
250	P. Emertonii Verrill & Smith	10 60	9 74	34.0	1817/2393	Chesapeake .
251	P. tincta Verrill	46	4	22.0	2415/2414	Virginia ....
252	P. chariessa Watson	46	3	52.0	340/1710	N. Atlantic ..
253	var. phalera Dall	....	.....	38.0	731	Cape Fear...
254	var. aresta Dall	....	.....	28.0	731	Cape Fear...
255	var. tellea Dall	....	.....	29.0	731	Cape Fear...
256	P. filifera Dall	12	9	17.5	331	Gulf of Mex .
257	P. Frielei Verrill	46	5	22.0	1198/1198	Delaware ...
258	P. hadria Dall	....	.....	27.0	407/1181	Cape Fear...
259	P. Bairdii Verrill	60	68	55.0	2444/2221	Rhode Island
260	P. Lottæ Verrill	46	7	11.5	1525	Delaware ...
	? Section GYMNOBELA Verrill.					
261	P. extensa Dall	10	2	12.2	640/1000	N. Atlantic ..
262	P. vitrea Verrill	46	6	8.0	384/428	Delaware ...
263	P. Blakeana Dall	10 46	1 8	8.0	100/1608	Gulf of Maine
264	var. agria Dall	....	.....	10.0	1685	Chesapeake .
265	P. curta Verrill	....	.....	16.0	843/1917	Rhode Island
266	P. tornata V. var. Malmii Dall	....	.....	5.0	805/1205	Gulf of Maine
267	*P. engonia* Verrill	....	.....	17.0	906/1608	Gulf of Maine
	Subgenus Taranis Jeffreys					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
†	..	†	..	....	....	....	....	....	....	....	....	Cape Fear...	
?†	..	....	..	....	....	....	....	....	....	....	....	N. lat. 38½° ..	
....	..	....	..	....	....	†	†	†	....	....	....	Martinique..	
....	..	....	..	....	....	....	....	†	....	....	....	Curaçoa.....	
?†	..	....	..	....	....	....	....	....	..	....	....	.....	
†	..	....	..	....	....	....	....	†	....	....	....	Santa Cruz..	
....	†	....	..	....	....	....	....	....	....	....	....	N. lat. 36° ...	
†	..	†	..	....	....	....	....	†	....	†	....	St. Vincent..	Pliocene.
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	....	†	....	....	....	....	....	.....	
....	..	....	..	....	....	....	....	....	....	....	....	N. lat. 39° 33′	
....	..	†	..	....	....	†	....	....	....	....	....	Gulf of Mex .	
†	..	....	..	....	....	....	....	....	....	....	....	Delaware....	
†	..	....	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	....	†	†	†	....	....	....	Yucatan.....	
†	..	....	..	....	....	....	....	....	....	....	....	.....	
†	†	†	..	....	....	†	....	†	....	....	....	Santa Cruz..	
†	..	....	..	....	....	....	....	†	....	....	....	Guadalupe ..	
†	†	†	..	....	....	....	....	....	....	....	....	Hatteras	
....	..	....	..	....	†	....	....	†	....	....	....	Gulf of Mex	
?†	..	....	..	....	....	....	....	....	....	....	....	Rhode Island	
....	..	†	..	†	....	....	....	†	....	†	....	Florida Str..	Pliocene.
†	†	....	..	....	....	....	....	....	....	....	....	.....	
....	..	*	*	*	*	*	....	*	....	....	....	Guadalupe ..	P. Pliocene.
....	..	....	..	....	....	*	....	....	....	....	....	.....	Pliocene. •
....	..	....	..	....	*	....	*	*	....	....	....	Yucatan	Pliocene.
....	..	*	..	....	....	....	....	....	....	....	....	C. Lookout..	
....	..	*	..	....	*	*	....	....	....	....	....	Key West...	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus ADMETE Moller.					
275	A.? microscopica Dall	....	.....	.....	$\frac{300}{780}$	Fernandina
276	A.? nodosa Verrill	46	9	12.0	$\frac{616}{624}$	Delaware
	Genus BENTHOBIA Dall.					
277	B. Tryoni Dall	35	6	13.0	731	Cape Fear
	Superfamily RHACHIGLOSSA.					
	Family OLIVIDÆ.					
	Genus OLIVA Bruguière.					
278	O. reticularis Lamarck	....	.....	.....	$\frac{0}{71}$	Key West
279	O. literata Lamarck	34	8, 8′	60.0	$\frac{0}{2}$	Hatteras
	Genus OLIVELLA Swainson.					
280	O. mutica Say	34	1, 2	13.0	.....	.....
281	O. nivea Gmelin	....	.....	.....	$\frac{0}{8}$	Sarasota
282	O. jaspidea Gmelin	....	.....	.....	$\frac{27}{805}$	Hatteras
283	var. fuscocincta Dall	....	.....	.....	$\frac{50}{250}$	Florida Keys
284	O. bullula Reeve	....	.....	.....	$\frac{72}{464}$	Hatteras
285	O. ———	....	.....	.....	.....	Key West
286	O. floralia Duclos	....	.....	.....	.....	Hatteras
	Family MARGINELLIDÆ.					
	Genus MARGINELLA Lamarck.					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	†	....	....	....	†	†	....	....	....	Yucatan.....	
†	..	....	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
										•			
....	..	....	..	....	*†	....	....	*†	*	....	....	Brazil.....	Pliocene.
....	..	*	*	*	*	*	*	....	....	....	....	Key West ...	Pliocene.
....	..	*	..	*	*	*	*	*	*	....	....	Trinidad	Pliocene.
....	..	....	..	....	*	*	....	*	*	....	....	Haiti	
....	..	*	*	*	*†	*	*	*†	*	....	....	Brazil.....	Pliocene.
....	..	....	..	....	*	....	....	*†	....	....	....	Barbados....	
....	..	†	..	....	†	....	....	†	*	....	....	Brazil.....	P. Pliocene.
....	..	....	..	....	*	....	....	*	....	....	....	Brazil.....	
....	..	*	..	*	*	*	....	*	*	....	....	Tortola	
....	..	....	..	....	*	*	....	*	....	....	....	Rum Cay....	
....	..	....	..	....	....	*	....	*	....	....	....	Aspinwall...	
....	..	....	..	....	*	....	....	*	....	....	....	Yucatan.....	
....	..	*	..	....	*	....	....	*	....	....	....	Swan Island.	
....	..	....	..	....	....	†	....	†	....	....	....	Cuba.....	
....	..	*	..	....	....	....	....	....	....	....	....	C. Lookout..	Miocene.
....	..	*	..	*	*	*	*	*	....	....	....	Jamaica.....	Pliocene.
†	..	†	..	....	....	....	....	....	....	....	....	Cape Fear...	
....	..	....	..	....	*	*	....	*	....	....	....	St. Thomas..	
....	..	....	..	....	†	....	....	*	....	....	....	Jamaica.....	
....	..	....	..	†	†	†	....	....	....	....	....	Yucatan.....	
....	..	†	††	....	....	....	....	....	....	....	....	Fernandina...	
....	..	....	..	....	*	....	....	†	....	....	....	Grenada	
....	..	....	†	....	....	....	....	†	....	....	....	Yucatan.....	
....	..	....	..	....	†	....	....	....	....	....	....	Yucatan.....	
....	..	*	†	....	*	*	....	....	....	....	....	Yucatan	Miocene.

TABLE V. E—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
303	Marginella amabilis Redfield	....	.....	.....	$\frac{72}{125}$	Florida Keys.
304	M. ———	....	.....	.....	.....	Hatteras ....
305	M. bella Conrad	....	.....	.....	.....	Hatteras ....
306	M. margarita Kiener	....	.....	.....	294	Georgia .....
307	M. ———	....	.....	.....	294	Fernandina .
308	M. ———	....	.....	.....	294	Fernandina .
309	M. fauna Sowerby	....	.....	.....	.....	Florida Keys
310	M. microgonia Dall	....	.....	.....	294	Fernandina .
311	M. denticulata Conrad	....	.....	.....	$\frac{5}{234}$	Hatteras ....
312	var. opalina Stearns	....	.....	.....	$\frac{9}{8}$	Tampa .....
313	M. aureocincta Stearns	....	.....	.....	$\frac{3}{44}$	Chesapeake .
314	M. seminula Dall	19	2	7.0	$\frac{334}{640}$	Fernandina .
315	M. ———	....	.....	.....	.....	Tampa .....
316	M. minuta Pfeiffer	....	.....	.....	$\frac{5}{234}$	Fernandina .
317	M. minima Guilding	....	.....	.....	$\frac{9}{27}$	C. Lookout ..
318	M. Redfieldii Tryon	....	.....	.....	229	Florida Str ..
319	M. fusca Sowerby	....	.....	.....	$\frac{37}{63}$	C. Lookout ..
320	M. succinea Conrad	19	6	12.0	$\frac{70}{1000}$	Fernandina .
321	M. styria Dall	....	.....	.....	$\frac{44}{279}$	Georgia .....
322	M. torticula Dall	....	.....	.....	$\frac{133}{219}$	Fernandina .
	Section VOLVARINA Hinds.					
323	M. avena Valenciennes	....	.....	.....	$\frac{10}{805}$	Key West ..
324	M. albolineata Orbigny	....	.....	.....	$\frac{80}{1000}$	Key West ...
325	M. subtriplicata Orbigny	....	.....	.....	$\frac{8}{111}$	Key West ...
326	M. lactea Kiener	....	.....	.....	$\frac{9}{10}$	Tortugas ....
327	M. pallida Donovan	....	.....	.....	$\frac{10}{110}$	Tortugas ....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla	Fla. Keys	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	†	....	....	†	....	....	....	Sombrero....	Miocene.
....	..	*	..	....	....	....	....	....	....	....	....	Cape Fear...	
....	..	*	..	....	....	....	....	....	....	....	....	Cape Fear...	Miocene.
....	..	....	†	†	....	....	....	*	....	....	....	Haiti	
....	..	....	†	....	....	....	....	....	....	....	....	.....	
....	..	....	†	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	*	....	....	*	....	....	....	Curaçoa....	
....	..	....	†	....	†	....	....	†	....	....	....	Cuba.....	
....	..	†	†	....	*	*	....	†*	....	....	....	Barbados....	Miocene.
....	..	....	..	....	*	*	....	....	....	....	....	Key West ...	Pliocene.
....	*	*	..	*	*	*	....	....	....	....	....	Gulf of Mex .	Pliocene.
....	..	....	?	....	....	....	†	†	....	....	....	Yucatan	
....	..	....	..	....	....	*	....	....	....	....	....	Gulf of Mex .	
....	..	....	†	....	*	*	....	†*	....	*	*	Barbados....	Miocene.
....	..	*	..	....	*	*	....	*	....	....	....	Haiti	
....	..	....	..	†	†*	....	....	*	....	....	....	Cuba.....	
....	..	†	†	....	*	....	....	*	*	....	....	St. Thomas..	
....	..	....	†	....	†*	*†	....	†	....	....	....	Sombrero....	
....	..	....	†	....	....	....	....	†	....	....	....	Sombrero....	Pliocene.
....	..	....	†	....	†	....	....	....	....	....	....	N. lat. 24° ...	
....	..	....	..	....	*	....	*†	†*	*	....	....	Aspinwall...	Pliocene.
....	..	....	..	....	*	....	....	†	*	....	....	Barbados....	
....	..	....	..	....	*†	....	....	*	....	....	....	Tortola	
....	..	....	..	....	*	....	....	*	....	....	....	Tortola	
....	..	....	..	....	*†	....	....	*	*	....	....	Tortola	Pliocene.
....	..	....	..	....	*	....	....	*†	....	....	....	Brazil	
....	..	....	..	....	*	....	....	*	....	....	....	St. Thomas..	
....	..	....	†	....	....	....	....	....	....	....	....	.....	
....	..	*†	†	†*	*†	*	....	....	....	....	....	Florida Str..	
....	..	....	..	....	....	*	....	....	....	....	....	Charlotte H	
...	..	†*	*	....	....	....	....	....	....	....	....	Fernandina .	Pliocene.
....	..	*	..	....	*	*	....	*	....	....	....	Guadalupe ..	Pliocene.
....	..	....	..	....	....	....	*	*	....	....	....	Carthagena .	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus SCAPHELLA Swainson.					
336	S. Junonia Hwass	34	5*a-e*	95.0	$\frac{1}{30}$	C. Lookout..
	Subgenus **Aurinia** H. & A. Adams.					
337	A. dubia Broderip	....	.....	.....	$\frac{34}{168}$	Hatteras ....
338	A. Gouldiana Dall	29	3	69.0	$\frac{20}{209}$	Cape Fear...
339	A. robusta Dall	35	2	119.0	$\frac{11}{250}$	Tampa .....
	Family TURBINELLIDÆ.					
	Genus TURBINELLA Lamarck.					
	Subgenus **Cynodonta** Schumacher.					
340	C. muricata Born	....	.....	.....	$\frac{9}{8}$	Florida Keys
341	*C. capitellum* Linné	....	.....	.....	.....	Florida Keys?
	Family MITRIDÆ.					
	Genus MITRA Lamarck.					
342	M. barbadensis Gmelin	....	.....	.....	.....	Key West....
343	M. nodulosa Gmelin	....	.....	.....	.....	Fort Macon..
344	M. Dupontii Kiener	....	.....	.....	.....	Florida Keys
345	M. sulcata Gmelin	....	.....	.....	.....	Jupiter Inlet
346	M. puella Reeve	....	.....	.....	.....	C. Lookout..
347	M. albocincta C. B. Adams	....	.....	.....	.....	Key West ...
348	M. Hanleyi Dohrn	....	.....	.....	.....	Florida Keys
349	var. gemmata Sowerby	....	.....	.....	.....	Charlotte H.
350	M. floridana Dall	48	5	6.0	.....	Marco.....
351	M. Swainsoni Brod. var. antillensis Dall.	38	7	80.0	$\frac{7}{171}$	C. Lookout..

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*	..	....	*	*	....	....	....	....	....	Florida Str..	P. Pliocene.
....	..	†	..	....	*	*	....	....	....	....	....	Cape Florida	
....	..	†	†	†	†	....	....	....	....	....	....	Key West ...	
....	..	....	..	....	....	†	....	†	....	....	....	Cuba.....	
....	..	....	..	....	*	....	....	*	....	....	....	Guadalupe ..	
....	..	....	..	....	?	....	....	*	....	....	....	Curaçoa.....	
....	..	....	..	....	*	....	....	....	....	....	....	Barbados....	
....	..	*	..	....	....	....	....	*	....	....	....	Darien	
....	..	....	..	....	*	....	....	?	....	....	....	?	
....	..	....	..	*	*	....	....	*	....	....	....	St. Thomas..	
....	..	†	..	....	*	....	....	*	....	....	....	Guadalupe ..	
....	..	....	..	....	*	....	....	*	....	....	....	St. Thomas..	
....	..	....	..	....	*	....	....	*	....	....	....	Haiti.....	
....	..	....	..	....	*	*	....	*	....	....	....	Jamaica.....	
....	..	....	..	....	*	....	....	....	....	....	....	Key West ...	
....	..	†	..	....	....	....	....	†	....	....	*	Grenada.....	Pliocene. ?
....	..	....	..	....	....	†	....	....	....	....	....	?	
....	..	....	..	....	†	....	....	....	....	....	....	Barbados....	
....	..	....	..	....	†	†	....	†	....	....	....	Barbados....	Miocene.
....	..	†*	..	....	†	*	....	†	....	....	....	Florida Str..	Pliocene.
....	..	†	..	....	....	....	....	....	....	....	....	?	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba.....	
....	..	....	..	....	....	....	†	†	....	....	....	Yucatan	Miocene.
....	..	....	..	....	†	....	....	†	....	....	....	Yucatan	
....	..	....	†	....	....	....	....	†	....	....	....	Barbados....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range
	Family FASCIOLARIIDÆ.					
	Genus FASCIOLARIA Lamarck.					
361	F. gigantea Kiener	....	.....	.....	0/10	Hatteras ....
362	F. tulipa Linné	....	.....	.....	0/10	Hatteras ....
363	F. distans Lamarck	....	.....	.....	0/4	Hatteras ....
	Subgenus **Mesorhytis** Meek.					
364	M. Meekiana Dall	36	7	15.5	220/400	Gulf of Mex.
	Genus FULGUR Montfort.					
365	F. pyrum Dillwyn	....	.....	80.0	0/60	Hatteras ....
366	F. canaliculata Say	73	1	250.0	.....	Cape Cod ....
367	F. perversa Linné	....	.....	375.0	0/2	Hatteras ....
368	var. coarctata Sowerby	....	.....	112.0	.....	Florida .....
369	F. carica Linné	74	1	200.0	0/10	Cape Cod ....
370	F. eliceans Montfort	....	.....	100.0	0/8	S. Carolina..
	Genus MELONGENA.					
371	M. corona Gmelin	....	.....	75.0	0/8	Gulf of Mex.
372	M. melongena Linné	....	.....	100.0	0/60	Florida Keys.
	Genus LATIRUS Montfort.					
	Subgenus **Leucozonia** Gray.					
373	L. cingulifera Lamarck	....	.....	.....	.....	Sarasota ....
374	L. ocellata Gmelin	....	.....	.....	.....	Cedar Keys..
	Subgenus **Latirus** s. s.					
375	L. brevicaudatus Lamarck	....	.....	.....	.....	Florida Str..

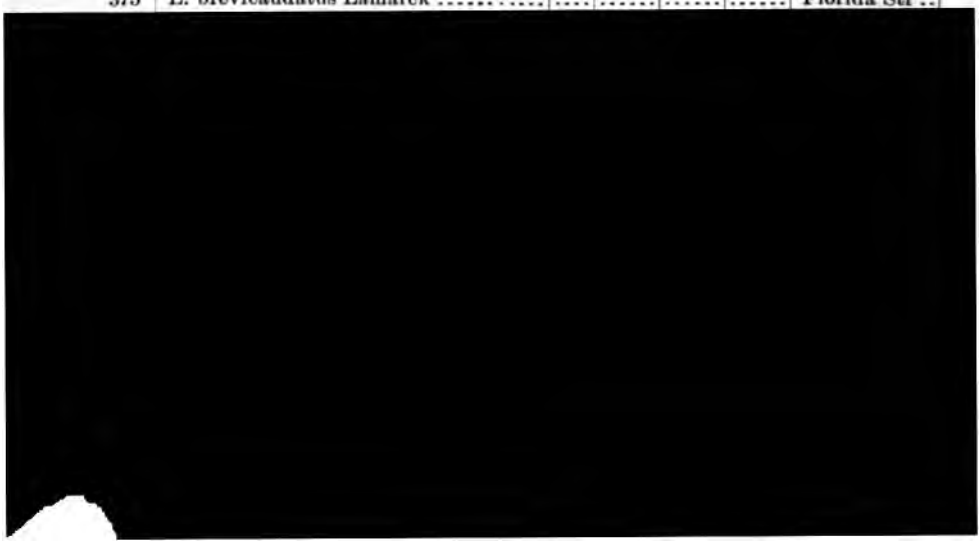


TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*	*	*	*	*	....	....	....	....	....	Florida Keys	
....	..	*	*	*	*	*	*	*	....	....	....	Carthagena	
....	..	*	....	....	*	*	*	....	....	....	....	Yucatan	
....	..	....	....	....	†	†	....	†	....	....	....	Cuba	
....	..	*†	*	*	*	*	*	....	....	....	....	Gulf of Mex.	P. Pliocene.
*	*	*	*	*	....	*	*	....	....	....	....	Gulf of Mex.	
....	..	*	*	*	*	*	*	*	....	....	....	Cuba	P. Pliocene.
....	..	....	..	....	....	*†	....	....	....	....	....	Gulf of Mex.	
*	*	*	*	*	*	*	*	*	....	....	....	St. Thomas	Miocene.
....	..	*	*	....	*	*	....	*	....	....	....	Campeche	
....	..	....	..	....	*	*	*	*	....	....	....	Guadalupe	
....	..	....	..	....	*	....	*	*	....	....	?	N. Grenada	
....	..	....	..	*	*	*	*	*	....	....	....	Brazil	
....	..	....	..	....	*	*	....	*	....	....	....	Guadalupe	
....	..	....	..	....	*	....	....	*	....	....	....	Brazil	
....	..	....	..	....	*	....	....	*	....	....	....	Swan Islands	
....	..	....	..	....	*	....	....	*	....	....	?	Santa Lucia	
....	..	....	..	....	†	*†	....	†	....	....	....	S. of Cuba	Pliocene?
....	..	....	..	....	†*	*†	....	†	....	....	....	Barbados	
....	..	....	..	....	*	*	....	....	....	....	....	C. Romano	
....	..	....	..	†	....	....	....	†	....	....	....	Bahamas	
....	..	†	..	....	....	....	....	†	....	....	....	Guadalupe	
....	..	....	..	....	*†	....	....	*†	....	....	....	Sombrero	
....	..	....	..	....	†	....	....	....	....	....	....	Cuba	
....	..	....	..	....	†	....	....	....	....	....	....	Cuba	
....	..	....	..	....	†	....	....	†	....	....	....	Sombrero	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
387	Fusus alcimus Dall	.....	.....	15.0	95	Gulf of Mex.
388	var. Rushii Dall	....	.....	8.5	200	Florida Str..
389	F. amphiurgus Dall	....	.....	14.0	101	Gulf of Mex.
	Family BUCCINIDÆ.					
	Genus BUCCINUM Linné.					
390	B. undatum Linné	72	12	50.0	$\frac{9}{650}$	Arctic Sea...
391	B. abyssorum Verrill	61	80	43.0	$\frac{42}{1309}$	N. lat. 42° ...
	Genus CHRYSODOMUS Swainson.					
	Subgenus **Sipho** Mörch.					
392	S. islandicus Linné	....	.....	.....	$\frac{30}{1650}$	Arctic Sea...
393	S. Stimpsoni Mörch	72	11	75.0	$\frac{10}{319}$	Arctic Sea...
394	S. pubescens Verrill	....	.....	60.0	$\frac{18}{640}$	Nova Scotia.
395	S. ———	....	.....	.....	528	Hatteras ....
396	S. pygmæus Gould { 48 / 50	9 / 4	.....		$\frac{10}{640}$	Nova Scotia.
397	var. planulus Verrill	....	.....	.....	.....	Rhode Island
398	S. Sarsii Jeffreys	61	81	40.0	$\frac{373}{2033}$	Rhode Island
399	S. obesus Verrill	....	.....	25.0	$\frac{224}{843}$	Hatteras ....
400	S. glyptus Verrill	61	82	30.0	$\frac{123}{960}$	Rhode Island
401	S. cælatus Verrill	....	.....	30.0	$\frac{75}{731}$	Rhode Island
402	S. Bocagei Fischer	....	.....	21.0	1121	Spain .....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	....	....	†	....	....	....	....	Yucatan.....	
....	..	....	..	†	†	....	....	....	....	....	....	Bahamas....	
....	..	....	..	....	†	....	....	....	....	....	....	Florida Keys	
*	..	*?	..	....	....	....	....	....	....	*	....	Charleston H	Pliocene.
*	..	†	..	....	....	....	....	....	....	....	....	Hatteras	
†	†	†	..	....	....	....	....	....	....	*†	....	S. Carolina..	
†	†	†	..	....	....	....	....	....	....	....	....	Hatteras	P. Pliocene.
†	†	†	..	....	....	....	....	....	....	....	....	S. Carolina..	
....	..	†	..	....	....	....	....	....	....	....	....	Savannah ...	
†	†	†	..	....	....	....	....	....	....	....	....	Cape Fear...	
....	..	†	..	....	....	....	....	....	....	....	....	Cape Fear...	
†	†	†	†	....	....	....	....	....	....	†	....	Fernandina .	
....	..	†	†	....	....	....	....	....	....	....	....	Fernandina .	
?	..	....	..	....	....	....	....	†	....	....	...	Jamaica	
†	..	†	..	....	....	....	....	....	....	....	....	Cape Fear...	
†	..	....	..	....	....	....	....	?	....	†	....	Africa.....	
....	..	....	†	†	†	....	....	†	....	....	....	Florida Str..	
....	..	†	..	....	....	....	....	....	....	....	....	Hatteras	
?†	..	....	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	†	†	....	....	†	....	....	....	Jamaica	
....	†	....	†	....	....	....	....	†?	....	....	....	St. Kitts?...	
....	..	†	..	....	....	....	....	....	....	....	....	S. Carolina..	Pliocene.
....	..	....	..	....	*	....	....	*	*	....	....	Trinidad	
....	..	....	..	....	*	....	....	*	....	....	....	Darien	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Subgenus **Tritonidea** Swainson.					
411	T. tincta Conrad	....	.....	.....	.....	Hatteras ....
412	T. cancellaria Conrad	....	.....	.....	.....	Jupiter Inlet
413	T. Orbignyi Payraudeau	....	.....	.....	$\frac{33}{23}$	Gulf of Mex.
414	T. limbata Philippi	....	.....	.....	24	Gulf of Mex.
	Genus PHOS Montfort.					
415	P. Candei Orbigny	....	.....	.....	$\frac{25}{160}$	Hatteras ....
416	P. parvus C. B. Adams	48	6	13.2	$\frac{3}{15}$	Charlotte H.
	Genus ENGINA Gray.					
417	E. turbinella Kiener	....	.....	.....	.....	Key West ...
	Genus NASSARIA Link.					
	Subgenus **Nassarina** Dall.					
418	N. Bushii Dall	15	12	9.0	$\frac{15}{24}$	Sand Key ...
419	N. glypta Bush	41	5, *a*	5.5	$\frac{14}{63}$	Hatteras ....
420	N. columbellata Dall	....	.....	12.2	124	Gulf of Mex.
421	N. Grayi Dall	32	12*a*	12.0	$\frac{73}{110}$	Gulf of Mex.
	Family NASSIDÆ.					
	Genus NASSA Lamarck.					
422	N. trivittata Say	48 50	13 7	.....	$\frac{2}{10}$	Nova Scotia.
423	N. obsoleta Say	50	9	.....	.....	Nova Scotia.
424	N. vibex Say	50	8	.....	$\frac{2}{3}$	Cape Cod ...
425	N. acuta Say	....	.....	.....	.....	N. Carolina..
426	N. ambigua Montagu	....	.....	.....	$\frac{2}{17}$	C. Lookout ..

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
		*		*	*	*	*	*				Vera Cruz	
				*		*	*	*				Darien	
							*	*				Yucatan	
					*			*				Cuba	
		†		*		†		†				Darien	
				*			*	*				Barbados	Pliocene.
					*			*				Jamaica	
					†			†				Barbados	
		*†			*							Florida Keys	Pliocene.
							†	†				Yucatan	
							†	†				Barbados	
*	*	*†	*									St. Augustine	Miocene.
*		*	*	*		*						Tampa	
*	*	*	*	*	*	*		*				Aspinwall	Pliocene.
		*	*	*		*	*	*				Barbados	Pliocene.
		?			*	*		*	*			Barbados	Pliocene.
		†*			*	*						Florida Keys	Pliocene.
		†			†	*		†*	*			Barbados	
			†		†			†				Barbados	
		*	*	*	*	*		*				Barbados	Pliocene.
					*	*						Cuba	
													Miocene.
*		*	*									Florida Keys	
						*						Charlotte H.	
*		*	*	*			*					Yucatan	
		*			*	*						Yucatan	
*†		*								†		Hatteras	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
437	Anachis albella C. B. Adams	....	.....	.....	.....	Cape Fear...
438	A. samanensis Dall	....	.....	.....	.....	Turtle Harb.
439	A. pulchella Kiener	....	.....	.....	.....	Key West ...
440	A. obesa C. B. Adams	....	.....	.....	.....	Hatteras ....
441	A. Hotessieriana Orbigny	....	.....	.....	.....	Tampa .....
442	A. amphissella Dall	19	10c	4.0	$\frac{2}{4}\frac{9}{1}\frac{4}{3}$	Fernandina .
443	var. Rushii Dall	....	.....	.....	$\frac{2}{4}\frac{9}{6}\frac{4}{2}$	Fernandina
	Subgenus **Nitidella** Swainson.					
444	N. nitidula Sowerby	....	.....	.....	.....	Jupiter Inlet.
445	N. cribraria Lamarck	....	.....	.....	.....	Key West ...
446	N. lævigata Linné	....	.....	.....	.....	Florida Keys
447	N. parvula Dunker	....	.....	.....	.....	Gulf of Mex .
448	N. moleculina Duclos	....	.....	.....	.....	Florida Keys
449	var. dicomata Dall	....	.....	.....	.....	Key West ...
	Subgenus **Astyris** Adams.					
450	A. lunata Say	50	17	.....	$\frac{0}{1\,2}$	Cape Ann ...
451	var. Duclosiana Orbigny	....	.....	.....	$\frac{0}{6\,3}$	Hatteras ....
452	A. pura Verrill	50	13?	.....	$1\frac{1}{2}\frac{4}{8}\frac{4}{5}$	Rhode Island
453	A. Raveneli Dall	....	.....	.....	$\frac{1}{2}\frac{8}{0}\frac{4}{8}$	Hatteras ....
454	A. multilineata Dall	....	.....	.....	$\frac{2}{2}\frac{0}{0}\frac{0}{2}$	C. Lookout ..
455	A. diaphana Verrill	35	9	9.0	$\frac{0}{4}\frac{4}{8}\frac{4}{7}$	Rhode Island
456	*A. rosacea* Gould	69	1	.....	$\frac{0}{6}\frac{0}{0}$	Arctic Seas..
457	A. fusiformis Orbigny	....	.....	.....	.....	Turtle Harb.
458	A. Verrillii Dall	19	8	9.0	$\frac{2}{8}\frac{1}{0}\frac{0}{8}$	Fernandina .
459	A. profundi Dall	....	.....	.....	$\frac{3}{8}\frac{4}{0}\frac{4}{5}$	Hatteras ....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....				....	*	*	....	*	....	....	....	Jamaica.....	
....				.	*	....	....	*	....	....	....	St. Thomas..	
....				.	*	....	....	*	....	....	....	Barbados....	
....				.	*	*	*	*			....	St. Thomas..	Pliocene.
....				?	....	*	....	*			....	Guadalupe ..	
....					....	....	....	*			....	Yucatan	
....					....	....	....	....			....	Florida Str..	
....				*	*	....	....	*	*	....	....	Barbados....	
....					*	....	....	*	*	....	....	Barbados....	
....					*	....	....	*	*	....	....	Aspinwall...	
....			..	....	....	....	*	*	....	....	....	Barbados....	
....			..	....	*	....	....	....	....	....	....	Key West ...	
....			..	....	*	....	....	....	....	....	....	Florida Str..	
*	*	*		*	*	*	....	....	....	....	....	Turtle Harb.	Pliocene.
....	..	†		*	*	*	....	*	....	....	....	Barbados....	
†	..	*		....	....	....	....	....	....	....	....	Hatteras	
....	..	†			....	....	....	....	....	....	....	Fowey Rocks	
....	..	*†			†	....	....	....	....	....	....	Cape Florida	
†	..	....			....	†	....	....	....	....	....	Gulf of Mex .	
††	..	....			....	....	....	....	....	*	*	New York...	
....	..	....			*	....	....	*	....	....	....	Barbados....	
....	..	....			†	....	....	†	....	....	....	Pernambuco.	
....	..	†			†	....	....	*	....	....	....	Aspinwall...	
....	..	*	..	....	....	*	....	....	....	....	....	Tampa Bay..	
....	..	....	..	†	....	....	....	*	....	....	....	Barbados....	
....	..	....	..	....	†	†	....	†	....	....	....	Guadalupe ..	
....	..	†*	..	....	....	†	....	†	....	....	....	Barbados....	
....		....	..	....	*	*	*	*	....	....	....	Aspinwall...	
....		*	..	....	*	*	....	*	....	....	....	Carthagena .	Pliocene.
....		*	..	....	*	*	....	*	....	....	....	Carthagena .	Pliocene.

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Subgenus **Phyllonotus** Swainson.					
467	P. pomum Gmelin	16	2	15.0	.....	Beaufort, N.C.
468	P. fulvescens Sowerby	....	.....	.....	.....	Hatteras ....
469	P. Pazi Crosse	15	1	32.0	330/350	Florida Str..
470	P. hystricinus Dall	16	4	21.0	146/254	Cuba.....
	Subgenus **Pteronotus** Swainson.					
471	P. macropterus Deshayes	....	.....	.....	63	Hatteras ....
472	P. phaneus Dall	42	1	17.0	334/434	Fernandina..
473	P. tristichus Dall	15	3	15.5	153/480	Florida Str..
	Genus EUPLEURA Adams.					
474	E. caudata Say	50	11	.....	1/3	Cape Cod....
475	E. Stimpsoni Dall	42	3	12.0	199/254	Fernandina..
	Genus TROPHON Montfort.					
	Subgenus **Boreotrophon** Fischer.					
476	B. vaginatus C. & J	....	.....	.....	843	N. Atlantic..
477	B. abyssorum Verrill	....	.....	8.0	843/2053	Rhode Island
478	B. lacunellus Dall	15	4	41.0	337/769	Cape Fear...
479	*B. actinophorus* Dall	15	2	17.5	149/248	Santa Cruz .
	Subgenus **Aspella** Mörch.					
480	A. hastula Reeve	....	.....	.....	14	Cape Fear...
481	*A. scalarioides* Blainville	....	.....	.....	.....	Mediterran'n
482	var. paupercula C. B. Adams	....	.....	.....	.....	West Florida
483	var. obeliscus A. Adams	....	.....	.....	.....	Vera Cruz...
484	var. lamellosa Dunker					Florida Keys

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*	*	*	*	*	*	*	....	....	....	Venezuela....	Pliocene.
....	..	*	..	....	....	*	*	....	....	....	....	Texas.....	P. Pliocene.
....	..	....	..	†	†	....	....	†	....	....	....	Guadalupe ..	
....	..	....	..	....	....	....	....	†	....	....	....	Martinique..	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	....	†	....	....	....	....	....	....	....	....	St.Augustine	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba.....	
*	*	*	*	*	*	*	....	....	*	....	†	Charlotte H .	Pliocene.
....	..	....	†	....	....	....	....	†	....	....	....	Barbados....	
....	..	†	..	....	....	....	....	†	....	* †	....	St. Kitts	Pliocene.
†	..	†	..	....	....	....	....	....	....	....	....	Hatteras	
....	..	†	..	....	....	†	....	†	....	....	....	Dominica ...	
....	..	....	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	*	..	....	....	....	....	....	....	....	....	Tropics.....	
....	..	....	..	....	....	....	....	....	....	*	....	Africa.....	
....	..	....	..	....	*	†	*	*	*	*	....	St. Thomas..	
....	..	....	..	....	....	....	*	*	....	....	....	St. Thomas..	
....	..	....	..	....	*	....	....	*	*	....	....	Cuba	
....	..	*	..	....	*	*	*	*	*	....	....	Sombrero ...	
....	..	*	..	....	*	*	....	*	....	....	....	Yucatan	
....	..	....	..	....	*	....	*	*	*	....	....	St. Thomas..	
....	..	....	..	....	*	....	*	*	....	*	....	St. Thomas..	Pliocene.
....	..	*	..	*	*	*	†*	*	....	....	....	Yucatan	Pliocene.
....	..	....	*	....	*	*	....	....	....	....	....	C.Romano...	
....	..	....	..	....	*	....	*	*	....	....	....	Yucatan	
*	*	*	*	....	....	*?	....	....	....	....	....	St.Augustine	Miocene.
....	..	....	..	....	*	*	....	....	....	....	....	Key West ...	Pliocene.

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range
494	Urosalpinx tampaensis Conrad	....	......	......	......	Cedar Keys
495	U. ? carolinensis Verrill	....	......	15.0	$\frac{130}{923}$	Hatteras ...
496	U. ? macra Verrill	....	......	13.0	$\frac{88}{938}$	Hatteras ...
	Genus TYPHIS Montfort.					
497	T. longicornis Dall	15 38	7 5	15.0 23.0	$\frac{137}{465}$	Gulf of Mex
	Subfamily *Purpurinæ*.					
	Genus PURPURA Bruguière.					
498	P. patula Linné	....	......	......	......	Jupiter Inlet
499	*P. lapillus* Linné	50	1, 2, 3	......	......	Norway ....
500	P. hæmastoma Linné	34 46	3, 4 1*a*–2*b*	50.0	......	Hatteras ...
501	P. deltoidea Lamarck	....	......	......	......	Jupiter Inlet
	Genus SISTRUM Montfort.					
502	S. roseum Reeve	....	......	......	......	Gulf of Mex
503	S. nodulosum C. B. Adams	....	......	......	......	C. Romano .
	Subfamily *Coralliophilinæ*.					
	Genus CORALLIOPHILA Adams.					
504	C. Deburghiæ Reeve	16 44	5 1	20.0 27.0	$\frac{50}{878}$	Hatteras ...
505	C. abbreviata Lamarck	....	......	......	$\frac{15}{100}$	Cape Fear..

[redacted]

TABLE V. E.—*List of Gastropoda*—Continued.

N.J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	....	*	....	....	....	....	....	Sarasota	
....	..	†	..	....	*†	....	....	....	....	....	....	Key West ...	
....	..	†	..	....	†	....	....	....	....	....	....	Cape Florida	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba.....	
....	..	....	..	*	*	*	*	*	*	....	*	Brazil	
*	..	....	..	....	....	....	....	....	....	*	....	New York...	Pliocene.
....	..	*			*	....	*	*	*	....	....	Trinidad	
....	..	....			*	*	*	*	*	*	....	St. Vincent .	
....	..	....	..	....	....	....	*	*	....	....	....	Barbados....	
....	..	....	..	....	*	*	....	*	....	....	....	Aspinwall...	
		†	..	....	†	†	....	†	....	....	....	Barbados....	Miocene.
			..	....	*	*	....	*†	....	*	....	Tropics	Pliocene.
				....	*	....	....	....	....	....	....	Key West	
				....	†	....	....	†	....	....	....	Cuba.....	
*	*			....	*	*	*	....	*	*	...	Texas.....	
	*	*		....	*	*	*	....	....	....	....	Key West ...	
		....		....	*	....	*	*	*	....	....	St. Thomas..	
		†		....	*	....	....	*	*	....	....	Barbados....	
		†	..	....	....	....	....	*	....	....	....	Yucatan.....	
		*	..	....	....	....	....	....	....	....	....	.....	
			..	....	....	....	....	....	....	....	....	Cape Fear...	
		*	..	....	....	....	....	....	....	....	....	S. Carolina..	Pliocene.
			..	....	....	....	....	†	....	....	....	Sombrero....	
			..	....	....	....	....	†	....	....	....	Grenada.....	
			..	†	....	....	....	*	....	....	....	Rum Cay....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
519	**Scala Dunkeriana Dall**	.....	.....	.....	.....	**Turtle Harb.**
520	S. nitidella Dall	.....	.....	13.5	$\frac{33}{63}$	Hatteras .....
521	S. ——	.....	.....	.....	8	Cape Florida
522	S. Frielei Dall	.....	.....	4.75	$\frac{63}{107}$	Hatteras .....
523	S. *sericifila* Dall	.....	.....	5.1	.....	Gulf of Mex.
524	S. Rushii Dall	.....	.....	.....	$\frac{0}{63}$	Hatteras .....
525	S. clathratula Adams	.....	.....	.....	$\frac{40}{146}$	Rhode Island
526	S. novemcostata Mörch	.....	.....	.....	$\frac{13}{20}$	Hatteras .....
527	S. babylonia Dall	42	8	30.0	731	Cape Fear...
528	S. ——	.....	.....	.....	940	Cedar Keys..
529	S. formosissima Jeffreys	18	11	8.0	339	N. Atlantic..
530	S. permodesta Dall	.....	.....	.....	.....	C. Lookout..
531	S. scipio Dall	.....	.....	16.0	$\frac{13}{20}$	Hatteras .....
532	S. polacia Dall	18	10	7.25	229	Florida Str..
533	S. Dalliana Verrill & Smith	61	91	10.5	$\frac{59}{192}$	Rhode Island
534	S. teres Bush	41	8	4.0	$\frac{14}{16}$	Hatteras .....
535	S. erectispina Mörch	.....	.....	.....	$\frac{5}{168}$	Hatteras .....
536	S. turricula Sowerby	.....	.....	.....	$\frac{19}{22}$	Hatteras .....
537	S. grœnlandica Perry	61 72	90) 105	.....	.....	Arctic Sea...
538	S. denticulata Sowerby	.....	.....	.....	.....	Hatteras .....
539	S. pernobilis Fischer & Bernardi	.....	.....	38.0	$\frac{107}{805}$	Hatteras .....
540	*S. belaurita* Dall	18	11*b*	8.3	73	.....
541	S. clathrus Linné	.....	.....	.....	.....	Bahamas .....
542	S. Krebsii Mörch	.....	.....	.....	.....	Tortugas .....
543	S. Candeana Orbigny	.....	.....	.....	.....	Tortugas .....
544	S. Blandii Mörch	.....	.....	.....	.....	Tortugas .....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Ber-mu-da.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	*	....	....	*	....	....	....	Haiti.	
....	..	†	..	....	....	*	....	....	....	....	....	Cedar Keys..	
....	..	....	..	....	*	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	....	....	?	*	....	....	....	Honduras ...	
....	..	†	..	....	....	....	....	*	....	....	....	Haiti.	
†	..	†	..	....	....	....	....	....	....	....	....	Hatteras	
....	..	†*	..	....	....	....	....	*	....	....	....	St. Thomas ..	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	....	†	....	....	....	....	....	.....	
....	..	....	..	....	†	....	....	....	....	....	....	Florida Keys	
....	..	†	..	....	....	....	....	*	....	....	....	Jamaica.....	
....	..	*	..	....	....	....	*	....	....	....	....	Vera Cruz...	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba.....	
†	..	†	..	....	....	....	....	....	....	....	....	Cape Fear...	
....	..	*	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	*	....	....	....	St. Thomas..	
....	..	*	*	....	....	....	....	*	....	....	....	Haiti.	
?	..	?*	..	....	....	....	....	....	....	*	*	Rhode Isl'd?.	Pliocene.
....	..	†	..	....	....	*	....	*	....	....	....	Bahamas	
....	..	†	..	....	....	....	....	†	....	....	....	Guadalupe ..	
....	..	....	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	?	....	....	*	*	....	....	Barbados....	
....	..	....	..	....	*	....	....	*	....	....	....	Sombrero . ..	
....	..	....	..	....	*	....	....	*	....	....	....	Cuba.....	
....	..	....	..	....	*	....	....	*	....	....	....	St. Thomas..	
*	*	*	..	....	....	*	....	....	....	....	....	Charlotte H.	Pliocene.
....	..	†	†	†	....	....	....	....	....	....	....	Florida Str..	
....	..	†	..	....	....	*	....	*	....	....	....	Santa Cruz..	
....	..	....	..	....	*	....	....	*	....	....	....	Guadalupe ..	
....	..	†	..	....	*	....	....	*	....	*	....	Haiti.	
....	..	....	..	....	....	....	....	†	....	....	....	Martinique ..	
†?	..	....	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	*	....	....	....	....	....	....	Florida Str..	
....	..	....	†	....	†	....	....	†	....	....	....	Cuba.....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus ACLIS Lovèn.					
554	A. lata Dall	18	8	5.5	$\frac{100}{294}$	Fernandina.
555	A. egregia Dall	18	12	13.0	$\frac{224}{785}$	Fernandina.
556	A. nucleata Dall	18	7	9.3	$\frac{224}{484}$	Fernandina.
557	A. tenuis Verrill	....	.....	3.8	$\frac{63}{1765}$	George's B'ks
558	A. striata Verrill	....	.....	4.0	$\frac{63}{100}$	B. of Fundy.
559	A. ———	....	.....	.....	$\frac{224}{780}$	Fernandina.
560	A. ———	....	.....	.....	$\frac{224}{780}$	Fernandina.
561	A. ———	....	.....	.....	294	Fernandina.
	Family JANTHINIDÆ.					
	Genus JANTHINA Lamarck.					
562	J. communis Lamarck	....	.....	.....	Pelagic	Nantucket ..
563	J. globosa Swainson	....	.....	.....	Pelagic	Gulf Stream.
564	J. prolongata Blainville	....	.....	.....	Pelagic	N. Atlantic ..
565	J. exigua Lamarck	....	.....	.....	Pelagic	Gulf Stream.
	Superfamily GYMNOGLOSSA.					
	Family EULIMIDÆ.					
	Genus EULIMA Risso.					
566	E. conoidea Kurtz & Stimpson	....	.....	.....	.....	Hatteras ....
567	E. gracilis C. B. Adams	....	.....	.....	.....	Hatteras ....
568	E. intermedia Cantraine	52	14	.....	$\frac{11}{645}$	Norway .....
569	E. jamaicensis C. B. Adams	....	.....	.....	.....	Cedar Keys..
570	E. subcarinata Orbigny	....	.....	.....	.....	Hatteras ....
571	E. Carolii Dall	....	.....	.....	.....	Hatteras ....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	†	....	....	....	....	†	....	....	....	Barbados....	
....	..	....	†	*	....	....	....	†	....	....	....	Guadalupe ..	P. Pliocene.
....	..	....	†	....	....	....	....	†	....	....	....	St. Vincent..	P. Pliocene.
†	..	*†	..	†	....	....	....	†	....	....	....	Florida Str..	
†	..	†	..	....	....	....	....	....	....	....	....	Hatteras	
....	..	....	†	†	....	....	....	†	....	....	....	Florida Str..	
....	..	....	†	†	....	....	....	†	....	....	....	Florida Str..	
....	..	....	†	....	....	....	....	....	....	....	....	.....	
*	*	*	*	*	*	*	*	*	*	*	....	Aspinwall...	
....	..	....	*	*	*	*		*	*	*	....	.....	
....	..	....	..	?	....	....	....	*	*	....	....	.....	
....	..	....	..	....	*	....	....	*	....	....	*	Barbados....	
....	..	*	*	....	*	*	....	*	....	....	....	West Indies .	Pliocene.
....	..	*	..	....	*	*	*	*	....	....	....	St. Thomas..	
†	†	*†	..	....	*	*	....	*†	....	†*	....	Barbados....	
....	..	....	..	....	....	*	....	*	....	....	....	Haiti	
....	..	*	..	....	*	*	....	*	....	....	....	Haiti	
....	..	*	..	....	*	....	....	*	....	....	....	Jamaica.....	Pliocene.
....	..	†	..	....	?	....	....	†	....	*	....	.....	
....	..	*	..	....	*	....	....	*	....	*	....	Barbados....	
....	..	†	..	....	....	....	†	....	....	*	*	Campeche...	
....	..	†*	..	....	†	* *	....	†	....	*	....	Haiti	
....	..	*	..	....	....	....	....	*	....	....	*	Barbados....	
....	..	†?	†	....	....	....	....	....	....	*†	....	Fernandina .	
....	..	....	†	....	....	....	†	†	....	....	....	St. Kitts	
....	..	....	..	....	*	*	....	....	....	....	....	Marco.....	
*	..	*?	..	....	*	....	....	....	....	....	....	Fla. Keys ?..	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus NISO Risso.					
581	N. splendidula Sowerby	....	.....	27.0	$\frac{18}{171}$	Cape Fear...
582	N. interrupta Sowerby	18	5, 6	20.0	$\frac{11}{8\frac{1}{4}}$	Florida Str..
583	var. *albida* Dall	18	5	8.1	116	.....
584	var. tricolor Dall	....	.....	.....	$\frac{18}{107}$	Hatteras ....
585	var. æglëës Bush	41	10, *a*	7.5	$3\frac{7}{8}$	Hatteras ....
586	var. *circinata* Dall	....	.....	.....	.....	.....
	Family PYRAMIDELLIDÆ.					
	Genus PYRAMIDELLA Lamarck.					
	Section LONGCHÆUS Mörch.					
587	P. crenulata Holmes	....	.....	.....	.....	S. Carolina..
588	P. candida Mörch	....	.....	.....	.....	Hatteras ....
	Section PYRAMIDELLA s. s.					
589	P. dolabrata Linné	....	.....	.....	.....	Sarasota ....
	Genus TURBONILLA Leach.					
590	T. lævis C. B. Adams	....	.....	.....	$\frac{18}{107}$	Hatteras ....
591	T. ——	....	.....	.....	.....	Estella Pass.
592	T. ——	....	.....	.....	$\frac{12}{80}$	Cape Fear...
593	T. puncta C. B. Adams	....	.....	.....	$\frac{12}{18}$	Hatteras ....
594	T. exilis C. B. Adams	....	.....	.....	$\frac{3}{6\frac{1}{2}}$	Hatteras ....
595	T. Bushiana Verrill	....	.....	12.0	$\frac{36A}{1467}$	Rhode Island
596	*T. Rathbuni* Verrill and Smith	63	104	.....	$\frac{64}{1395}$	Rhode Island
597	T. pusilla C. B. Adams	....	.....	.....	$\frac{16}{294}$	Hatteras ....
598	T. ——	....	.....	.....	$\frac{31}{124}$	Hatteras ....

TABLE V. E.—*List of Gastropoda*—Continued.

N.J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*	..	....	....	†	....	....	....	....	*	New Grenada	
....	..	....	..	....	†	....	....	....	....	....	*	Centr. Am. .	
....	..	....	..	....	....	....	....	*	....	....	....	St. Lucia	
....	..	†*	..	....	....	....	....	....	....	..	....	N. Carolina..	
....	..	*	..	....	....	*	....	....	....	....	....	Tampa	
....	..	....	..	....	....	....	....	*	....	....	....	Barbados...	
....	..	*	..	....	*	*	....	*	....	....	....	St. Thomas ..	Pliocene.
....	..	*	*	....	*	*	....	*	....	....	....	Barbados....	
....	..	....	..	....	*	*	....	*	....	....	....	Barbados....	P. Pliocene.
....	..	†*	..	....	....	....	....	*	....	....	....	Jamaica.....	
....	..	....	..	*	....	....	....	*	....	....	....	Honduras ...	
....	..	†*	..	....	....	*	....	....	....	....	....	Charlotte H.	
....	..	*	..	....	....	....	....	*	....	....	....	Haiti.....	
....	..	†*	..	....	*	*	....	*	....	....	....	Haiti.....	
†?	..	....	..	....	....	....	....	†	....	?	....	Old Provid'ce	
†?	..	....	..	....	....	....	....	....	....	....	....	.....	
....	..	*	*	....	....	....	....	*	....	....	....	Barbados....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	*	..	....	*	*	....	....	....	....	....	Charlotte H.	
†	..	....	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
†	..	....	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	†	†	....	†	....	....	....	Barbados....	
....	..	††	..	....	*	*	....	†	....	*	....	Barbados....	P. Pliocene.
....	*	*	..	*	....	....	....	....	....	....	....	East Florida.	
....	..	†*	..	....	....	....	....	*	....	....	....	Jamaica.....	
....	..	*	..	....	*	....	....	*	....	....	....	Jamaica.....	
....	..	*	..	....	*	*	....	*	....	....	....	St. Thomas ..	
....	..	*	..	....	*	*	....	....	....	....	....	Key West ...	
....	..	*	*	....	....	*	....	*	....	....	*	Bahamas	
....	..	†*	..	....	*	....	....	*	....	....	....	Haiti	
....	..	†*	..	....	....	....	....	*	....	....	....	Haiti	
....	..	†*	..	....	....	....	†	†	....	....	....	Yucatan.....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Subgenus **Parthenia** Lowe.					
614	P. cedrosa Dall	48	4	5.5	.....	Cedar Keys..
	Subgenus **Stylopsis** A. Adams.					
615	S. resticula Dall	....	.....	3.5	.....	Gulf of Mex .
	Subgenus ? **Careliopsis** Mörch.					
616	C. styliformis Mörch	....	.....	.....	$\frac{2}{5}\frac{2}{1}$	Hatteras ....
	Genus EULIMELLA Forbes.					
617	E. unifasciata Forbes	19	11c	6.0	$\frac{8}{1}\frac{0}{2}\frac{0}{0}$	Britain.....
618	E. ——	....	.....	.....	$\frac{1}{1}\frac{0}{2}\frac{7}{4}$	Hatteras ....
619	E. ——	....	.....	.....	$\frac{6}{1}\frac{3}{0}\frac{3}{7}$	Hatteras ....
620	E. ——	....	.....	.....	168	C. Lookout..
621	E. scillæ Scacchi	....	.....	.....	$\frac{6}{5}\frac{6}{1}$	Norway.....
622	E. lissa Verrill	....	.....	6.0	142	Hatteras ....
	Genus PERISTICHIA Dall.					
623	P. toreta Dall	42	10	10.8	$\frac{3}{2}\frac{3}{1}$	C. Lookout..
624	P. agria Dall	....	.....	6.0	$\frac{3}{6}\frac{3}{3}$	Hatteras ....
	Genus OSCILLA Adams.					
625	O. nivea Mörch	48	2	8.4	.....	Key West ...
	Genus SYRNOLA A. Adams.					
626	S. ——	....	.....	.....	205	Cape Fear...
627	S. producta C. B. Adams	52	13	.....	.....	Mass. Bay ...
628	S. fusca C. B. Adams	52	15	.....	.....	Cape Cod....
	Genus ODOSTOMIA Fleming.					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	....	*	....	....	....	....	....	Gulf of Mex .	
....	..	....	..	....	*	....	....	....	....	....	....	Key West ...	
....	..	†*	..	....	....	*	....	*	....	....	....	St. Thomas ..	
....	..	†	†	....	....	†	....	....	....	....	....	Barbados....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	*	..	....	....	....	....	....	....	....	....	.....	
....	..	*	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	*	....	....	*	....	....	....	West Indies .	
....	..	†	..	....	....	....	....	....		....	....	.....	
....	..	*	..	....	*	*	....	....		....	....	Key West ...	
....	..	†	..	....	*	....	....	....		....	....	Key West ...	
....	..	....	..	....	*	....	....	*	....	....	....	Martinique ..	
....	..	*	..	*	*	....	....	*	....	....	....	Haiti.....	
*	..	....	..	.	....	....	....	....	....	....	....	Delaware ? ..	
*	..	....	..	.	....	....	....	....			....	Delaware ? ..	
....	..	†	..		....	....	....	....			....	East Florida.	
....	..	*†	..		....	....	....	....			....	East Florida.	
....	..	*†	..	.	....	....	....	....	....	....	....	Cape Fear...	
....	..	†*	..	†	....	*	....	....	....	....	....	West Florida.	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	*	..	....	....	....	....	....	....	....	....	.....	
*	..	....	..	....	....	....	....	....	....	....	....	New Jersey..	
*	..	....	..	....	....	....	....	....	....	....	....	Delaware B..	
*	*	*	*	*	....	*	....	....	....	....	....	Tampa	
*	..	*	..	*	*	*	....	....	....	....	....	Florida Keys.	
....	..	....	..	*	....	....	*	....	....	....	....	Key West ...	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Superfamily TÆNIOGLOSSA.					
	Family TRITONIIDÆ.					
	Genus DISTORTRIX Link.					
640	D. reticulata Link	....	.....	.....	$\frac{23}{154}$	Hatteras ....
	Genus GYRINEUM Link.					
641	G. affine Broderip	....	.....	.....	.....	Hatteras ....
	Genus TRITONIUM Link.					
642	T. tritonis L. var. nobilis Conrad	....	.....	.....	121	Key West ...
	Subgenus **Colubraria** Schumacher.					
643	C. testacea Mörch	....	.....	.....	.....	Hatteras ....
644	C. lanceolata Menke	....	.....	.....	.....	Hatteras ....
645	*C. Swiftii* Tryon	....	.....	.....	.....	Bermuda ....
646	*C. reticulata* Blainville	....	.....	....	.....	Nassau .....
	Subgenus **Ranularia** Schumacher.					
647	R. tuberosa Lamarck	....	.....	.....	.....	Key West ...
	Subgenus **Lampusia** Schumacher.					
648	L. chlorostoma Lamarck	....	.....	.....	.....	Jupiter Inlet.
649	L. pileare Lamarck	....	.....	.....	.....	Key West ...
650	L. gracile Reeve	29	2	25.5	$\frac{3A}{109}$	Gulf of Mex .
651	*L. pharcida* Dall	36	2	23.6	82	Antilles ?....
652	L. labiosa Wood	....	.....	.....	$\frac{11}{49}$	Hatteras ....
653	L. olearium Linnæus	....	.....	.....	.....	Hatteras ....
654	L. cynocephala Lamarck					Florida Str.

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	†*	..	....	*	*	....	....	....	....	....	Barbados....	
....	..	†	..	....	†	....	†	†	....	....	†	Tropics	
....	..	....	..	....	†	....	....	†	*	?	....	Barbados....	
....	..	†	..	....	*	....	*	†	....	....	....	Sombrero....	Pliocene.
....	..	†	..	....	*	....	†	*	*	....	....	Barbados....	
....	..	....	..	?	....	....	....	†	*	....	....	Barbados....	
....	..	....	..	?	....	....	....	*	....	*	....	Haiti.....	
....	..	....	..	....	*	....	....	*	*	....	*	Tropics.....	
....	..	....	..	*	*	....	*	†	*	....	....	Barbados....	
....	..	....	..	....	*	....	....	*	*	....	....	Trinidad	
....	..	....	..	....	....	*	....	†	....	....	....	Aspinwall ...	
....	..	....	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	*	..	....	....	....	....	*	....	*	....	Tropics.....	
....	..	†	..	....	....	....	*	*	....	....	....	Carthagena .	
....	..	....	..	....	*	....	*	*	....	....	....	Margarita Id.	
....	..	....	..	*	*	*	....	*	*	....	....	Guadalupe ..	
....	†	†	..	....	....	†	....	....	....	....	....	Cedar Keys..	
....	..	†	..	....	....	....	....	†	....	†	....	Africa.....	
....	..	....	..	....	....	....	....	†	....	....	....	.....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family CASSIDIDÆ.					
	Genus CASSIS Lamarck.					
659	C. cameo Stimpson	....	.....	.....	.....	Hatteras ....
660	C. tuberosa Linné	....	.....	.....	.....	Hatteras ....
661	C. testiculus Linné	....	.....	.....	.....	Hatteras ....
662	C. inflata Shaw	....	.....	.....	.....	Hatteras ....
	Genus GALEODEA Link.					
663	G. Coronadoi Crosse	....	.....	.....	124	Cape Fear...
	Genus LAMBIDIUM Link.					
664	L. oniscus Linné	....	.....	.....	.....	Tortugas ....
	Genus ONISCIDIA Swainson.					
65	O. Dennisoni Reeve	....	.....	.....	130	Gulf of Mex.
	Genus SCONSIA Gray.					
666	S. striata Lamarck	....	.....	.....	85	Cape Florida.
	Family DOLIIDÆ.					
	Genus DOLIUM Lamarck.					
667	D. galea Linné	....	.....	.....	.....	Hatteras ....
668	D. perdix Linné	....	.....	.....	.....	Florida Keys.
	Subgenus **Eudolium** Dall.					
669	E. Crosseanum Monterosato	15 44 62	5 2*a*–*b* 83, *a*	35.0	$\frac{80}{407}$	Rhode Island
670	*E. Verrillii* Dall	35	12	32.0	73	Grenada.....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Ber-mu-da.	Eur.	West Am.	Southern extr me range.	Range in time.
....	..	*	*	....	*	*	....	*	..	....	....	Barbados....	
....	..	*	*	....	....	*	....	*	....	....	....	Barbados....	
....	..	*	..	....	*	....	*	*	*	....	....	Trinidad	
....	..	†*	..	†	†	†	*	*†	....	....	....	Brazil.....	
....	..	†	..	....	....	....	....	?*†	....	....	....	Matanzas ...	
....	..	....	..	?	*	....	....	*	....	....	....	Trinidad	
....	..	....	..	....	....	....	†	†	....	....	....	Guadalupe ..	
....	..	....	..	....	†	....	....	†	....	E. I.	....	Barbados....	
....	..	*	..	....	*	*	*	*	....	....	....	Trinidad	
....	..	....	..	....	*	*	....	*	*	....	....	Brazil.....	
....	†	†	†	....	†	....	....	†	....	†	....	Barbados....	
....	..	....	..	....	....	....	....	†	....	....	....	.....	
....	..	*	*	*	*	*	*	*	....	....	....	West Indies .	
....	..	*	..	....	*	....	....	*	....	....	....	Brazil.....	
....	..	*†	..	....	....	....	*†	*†	....	....	....	Brazil.....	
....	..	†*	*	....	*†	*	....	†*	....	....	....	Barbados....	
....	..	....	..	....	†	....	....	†	....	....	....	Sombrero ...	
....	..	....	*	....	*	*	....	*	*	....	....	Trinidad	
....	..	....	†	....	....	....	....	†	....	....	....	Barbados....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family CYPRÆIDÆ.					
	Genus CYPRÆA Linné.					
678	C. exanthema Linné	....	.....	100.0	$\frac{0}{10}$	Hatteras ....
679	C. cinerea Gmelin	....	.....	.....	$\frac{0}{183}$	Hatteras ....
680	C. spurca Linné	....	.....	.....	$\frac{0}{25}$	Cedar Keys..
681	var. flaveola Lam	....	.....	.....	.....	Key West ...
	Genus TRIVIA Gray.					
682	T. pediculus Linné	....	.....	.....	.....	St. Augustine
683	T. suffusa Gray	....	.....	.....	.....	Cedar Keys..
684	T. subrostrata Gray	....	.....	.....	$\frac{80}{177}$	Florida Str..
685	T. nivea Gray	....	.....	.....	.....	Florida Keys
686	T. candidula Gaskoin	....	.....	.....	$\frac{18}{140}$	Hatteras ....
687	T. globosa Gray	....	.....	.....	$\frac{23}{640}$	Cedar Keys..
688	T. quadripunctata Gray	....	.....	.....	$\frac{0}{15}$	Jupiter Inlet
	Genus ERATO Risso.					
689	E. Maugeriæ Gray	....	.....	.....	$\frac{0}{63}$	Hatteras ....
	Family CARINARIIDÆ.					
	Genus CARINARIA Lamarck.					
690	C. mediterranea Peron & Lesueur	....	.....	.....	.....	N. lat. 40°...
	Genus ATLANTA Lesueur.					
691	A. Peronii Lesueur	43 66	4, 4*a* 110*a*	....	Pelagic	N. lat. 42°...
692	A. Gaudichaudi Eyd. & Soul	66	111	.....	Pelagic	N. lat. 40°...
693	A. rosea Souleyet	....	.....	.....	Pelagic	N. lat. 41°...

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*	..	....	*	*	*	*	....	....	*	Darien	
....	..	†	..	....	†	†	*	*	....	....	....	Guadalupe ..	
....	..	....	..	*	*	*	....	*	....	*	....	Barbados....	
....	..	....	..	....	*	....	....	*	....	....	....	Swan Islands	
....	..	....	*	*	*	*	....	*	*	....	....	Barbados....	Pliocene.
....	..	....	..	....	*	*	*	*	....	....	....	Barbados....	
....	..	....	..	....	* †	....	....	* †	....	....	....	Barbados....	
....	..	....	..	....	*	....	....	*	....	....	....	Barbados....	
....	..	....	..	....	*	*	....	† *	....	*	....	Barbados....	
....	..	....	..	....	* †	*	....	* †	....	....	....	Barbados....	Pliocene.
....	..	....	..	....	*	....	....	*	*	....	....	Barbados....	
..	.	* †	..	....	*	*	*	..	....	....	....	Aspinwall...	Pliocene.
.	.	*	..	....	*	....	....	*	....	....	....	Tropics	Pliocene
..	.	*	*	*	*	*	*	*	*	*?	?	Tropics	Pliocene.
*	.	..	*	....	....	....	....	....	....	....	....	Tropics	
*	.	..	*	....	....	....	....	....	....	....	....	Tropics	
*	.	....	*	....	....	....	....	....	....	....	....	Tropics	
*	.	....	..	....	....	....	....	....	....	....	....	.....	
*	.	*	..	....	....	....	....	....	....	....	....	Tropics	
.	.	*	*	*	*	*	*	*	*	....	....	Tropics	P. Pliocene.
..	.	....	..	....	*	....	....	*	*	....	....	Carthagena .	
..	.	*	..	*	*	*	*	*	*	....	....	Aspinwal[1]...	
..	.	....	..	*	*	....	....	*	....	....	....	Guadalupe ..	
..	.	....	..	....	*	....	....	*	....	....	....	Guadalupe ..	
..	.	....	*	*	*	*	....	....	....	....	....	Guadalupe ..	? Pliocene,

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family TRIFORIDÆ.					
	Genus TRIFORIS Deshayes.					
	Section TRIFORIS s. s.					
703	T. mirabilis C. B. Adams	....	.....	.....	.....	C. Lookout ..
704	T. lilacina Dall	....	.....	9.0	6	Turtle Harb.
	Section MASTONIA Hinds.					
705	T. perversa L. var. nigrocincta Ad.	....	.....	.....	$\frac{0}{30}$	Cape Cod ....
706	T. decorata C. B. Ad. var. olivacea Dall	....	.....	.....	.....	W. Florida ..
707	T. pulchella C. B. Adams	....	.....	.....	.....	Florida Str..
708	T. turristhomæ Orbigny	41	6	.....	.....	Hatteras ....
709	T. melanura C. B. Adams	....	.....	.....	.....	Hatteras ....
	Section INELLA Bayle.					
710	T. longissima Dall	20	10	26.0	$\frac{175}{450}$	Hatteras ....
711	T. triserialis Dall	20	5*a*, 6*a*	15.5	$\frac{124}{134}$	Hatteras ....
712	var. aspera Jeffreys	....	.....	.....	$\frac{125}{131}$	N. Atlantic ..
713	var. intermedia Dall	20	8	11.0	.....	Florida Str..
714	T. colon Dall	20	12	12.0	$\frac{450}{1002}$	Florida Str..
	Section SYCHAR Hinds.					
715	T. bigemma Watson	....	.....	.....	$\frac{204}{640}$	Fernandina .
716	var. hircus Dall	20	11	12.5	640	Gulf of Mex .
[illegible]						

TABLE V. E.—*List of Gastropoda*—Continued.

N.J	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	....	....	..	....	*	....	....	*	....	..	....	Jamaica.....	
....	..	....	..	....	*	....	....	....	....	..	....	Florida Str..	
*	*	*	*	....	*	*	....	....	....	*	....	Key West?..	Pliocene.
....	..	....	..	....	*	*†	....	*	....	..	....	Haiti.....	
....	..	....	..	....	*†	....	....	*	....	..	....	Haiti.....	
....	..	....	..	....	*†	....	....	*	....	....	....	Guadalupe..	
....	..	....	..	....	*	....	....	*	....	..	....	Jamaica.....	
....	..	....	..	....	†	....	....	†	....	..	....	Cuba.....	
....	..	....	..	....	†	....	....	†	....	..	....	Barbados....	
....	..	....	†	....	†	....	....	†	....	*	....	Florida Str..	
....	..	....	..	....	†	....	....	†	....	..	....	Barbados....	
....	..	....	..	....	†	....	†	†	....	..	....	Yucatan.....	
....	..	....	†	....	....	....	....	†	....	..	....	St. Thomas..	
....	..	....	..	....	....	....	†	†	....	..	....	Yucatan.....	
....	..	....	..	....	....	....	†	†	....	..	....	Yucatan.....	
....	..	....	..	....	....	....	†	†	....	....	....	Yucatan.....	
....	..	....	†	....	....	....	†	†	....	....	....	Culebra.....	
....	..	....	..	....	*†	....	†	....	....	....	....	Yucatan.....	
....	..	....	..	....	....	....	†	....	....	....	....	Yucatan.....	
....	..	....	..	†	....	....	....	†	....	..	....	Bahamas....	
*	..	..	.	....	*	*	*	.	..	..	....	Haiti	Miocene.
....	..	....	.	....	*	....	....	....	..	..	....	Key West ...	
....	..	....	.	*	*	*	*	*	*	..	....	Haiti	
....	..	....	.	†	†	*†	....	†	..	..	....	Barbados....	
....	..	....	.	....	....	†	....	....	..	..	....	Gulf of Mex .	
....	..	†	.	....	....	....	....	....	..	..	....	Hatteras	
....	..	....	.	....	†	....	....	†	..	..	....	Cuba.....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Section METAXIA Monterosato.					
730	C. abrupta Watson	20	5	4.3	$\frac{15}{100}$	Cape Fear...
731	C. metaxæ Della Chiaje	....	.....	.....	$\frac{3}{220}$	Hatteras ....
732	var. tæniolata Dall	....	.....	.....	$\frac{15}{52}$	C. Lookout..
	Subgenus **Eumeta** Mörch.					
733	E. subulata Montagu	20 52	4 1	14.3	$\frac{8}{15}$	Cape Cod....
	Subgenus **Cerithiella** Verrill.					
734	C. Whiteavesii Verrill	....	.....	.....	$\frac{235}{243}$	Gulf St. Law.
	Family CERITHIIDÆ.					
	Genus Bittium Leach.					
735	B. alternatum Say	52	4	.....	.....	Mass. Bay...
736	B. ? (Alaba ?) Adamsi Dall	....	.....	.....	.....	Hatteras ....
737	B. ? (Alaba ?) cerithidioides Dall	....	.....	.....	.....	C. Lookout..
	Section DIASTOMA Deshayes.					
738	B. varium Pfeiffer	....	.....	.....	.....	Chesapeake .
	Genus CERITHIUM Bruguière.					
739	C. floridanum Mörch	....	.....	.....	.....	Hatteras ....
740	C. algicola C. B. Adams	....	.....	.....	.....	Tampa ....
741	C. uncinatum (Gmel.) Tryon	....	.....	.....	.....	Key Largo ..
742	C. eburneum Bruguière	....	.....	.....	.....	Key West ...
743	C. literatum Born	....	.....	.....	.....	Jupiter Inlet
744	var. semiferrugineum Lamarck	....	.....	.....	.....	St. Augustine
745	C. muscarum Say	....	.....	.....	.....	Jupiter Inlet

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*	?†	....	....	....	....	†	....	†	....	Barbados....	
....	..	*	..	....	*†	....	....	†	....	*	....	Key West ...	
....	..	†*	..	....	....	....	....	....	....	....	....	Cape Fear...	
*		*	..	....		*	*	*	....	....	....	Grenada.....	
....		†	†	....	....	....	....	....	....	....	....	Fernandina..	
*		*†	..	....	....	....	....	....	....	....	....	C. Lookout..	
....		*	..	....	*	*	....	*	....	....	....	Haiti	
....		*	..	....	....	....	....	*	....	....	....	Haiti	
....		*		....	*	*	*	*	....	....	....	St. Thomas ..	
....					*	*	....	*		..	....	Cuba.....	Pliocene.
....					*	*	....	*		..	....	Jamaica.....	
....					*	....	....	*		..	....	Jamaica.....	
....					*	....	....	*		..	....	Swan Islands	
....					*	*	....	*		....	....	Swan Islands	
....			*	....	*	....	....	*	....	....	....	Santa Cruz..	
....			..	*	*	*	....	....	*	....	....	Jamaica.....	
				....	*	*	....	*	*	....	....	Curaçoa.....	
				....	*	*	....	*	*	....	....	Guadalupe ..	
				....	*	*	....	*	*	....	....	Venezuela...	
				....	*	*	....	†	....	....	....	Jamaica.....	
			*	*	*	*	*	....	....	....	....	Key West ...	
		....	..	....	....	?	*	*	....	....	....	Jamaica.....	
					*	*	....	*	....	....	....	Bahamas....	
					*	....	....	*	*	....	....	Darien.....	
					*	....	....	*	....	....	....	Barbados....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family MODULIDÆ.					
	Genus MODULUS Gray.					
755	M. modulus Linné	....	.....	.....	.....	Hatteras ....
756	var. floridanus Conrad	....	.....	.....	.....	Florida Keys.
757	var. catenulatus Philippi	....	.....	.....	.....	Florida Keys.
	Family TRICHOTROPIDÆ.					
	Genus TRICHOTROPIS Sowerby.					
	Subgenus **Mesostoma** Deshayes.					
758	M. migrans Dall.	29	8	9.25	80	Florida Str..
	Subgenus **Dolophanes** Gabb.					
759	*D. Gabbi* Dall	29	7	9.0	785	.....
760	D. columbella Dall	....	.....	.....	.....	Gulf of Mex .
	Family CÆCIDÆ.					
	Genus CÆCUM Fleming.					
761	C. floridanum Stimpson	....	.....	.....	$\frac{2}{16}$	Hatteras ....
762	C. pulchellum Stimpson	50	22	.....	$\frac{1}{32}$	Cape Cod ...
763	C. instructum De Folin	....	.....	.....	.....	Hatteras ....
764	C. bipartitum De Folin	....	.....	.....	.....	Hatteras ....
765	C ———	....	.....	.....	.....	Florida Keys.
766	C. Cooperi Smith	43	8	.....	.....	Cape Cod....
767	C. decussatum De Folin	....	.....	.....	.....	Key Largo ..
768	C. carolinianum Dall	....	.....	.....	$\frac{3}{64}$	Hatteras ....
769	C ———	....	.....	.....	.....	Tampa .....
770	C. globosum Montagu					Cape Cod....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	*	..		*	*	....	*	*	....	....	Carthagena .	Pliocene.
....	..	....	..	..	*	*	....	*	*	....	....	St. Thomas..	Pliocene.
....	..	....	..	..	*	....	....	*	....	....	....	St. Thomas..	
....	..	....	..	..	†	....	....	†	....	....	....	Havana	
....	..	....	..	..	....	....	....	†	....	....	....	St. Vincent..	Miocene.
....	..	....	..	..	†	....	....	†	....	....	....	Havana	Miocene.
....	..	*	..	..	*	*	....	*	....	....	....	Brazil.....	Pliocene.
*	..	*	..	..	*	....	....	....	....	....	....	Tortugas....	
....	..	*	..	..	....	*	....	....	....	....	....	Tampa	Pliocene.
....	..	*	..	..	....	*	....	....	....	....	....	.....	
....	..	....	..	..	*	....	....	....	....	....	....	Key West ...	
*	..	*	..	..	....	....	....	*	....	....	....	Jamaica	Pliocene.
....	..	....	..	..	*	....	....	*	....	....	....	Bahamas....	
....	..	†	..	..	*	*	....	....	....	....	....	Tortugas....	
....	..	....	..	..	....	*	....	....	....	....	....	Tampa	
....	..	*	..	..	....	*	....	....	....	*	....	Tampa	Pliocene.
....	..	....	..	....	*	*	....	*	....	....	....	Jamaica	
....	..	....	..	....	*	*	....	*	..	..	....	Jamaica	
....	..	....	..	....	....	*	....	*	..	..	....	Jamaica	Pliocene.
†	..	†	..	†	....	†	†	†	..	..	....	Brazil	Miocene.
....	..	†	†	....	....	....	†	†	..	..	....	Brazil	
....	..	....	..	....	†	....	....	†	..	..	....	Culebra	
....	..	....	..	....	....	†	....	†	..	..	....	Old Provid'ce	
....	..	....	..	†	....	....	....	†	..	..	....	Brazil	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family VERMETIDÆ.					
	Genus SILIQUARIA Bruguière.					
779	S. squamata Blainville	....	.....	.....	$\frac{2}{7\,6\,3}$	Sarasota ....
780	S. modesta Dall	26	4	26, 0	$\frac{9\,4}{8\,0\,5}$	Cedar Keys..
	Genus VERMICULARIA Lamarck.					
781	V. spirata Philippi	51	4	.....	$\frac{2}{7\,7\,5}$	N. England..
782	V.? nigricans Dall	....	.....	.....	$\frac{2}{7\,4}$	Gulf of Mex .
	Genus SIPHONIUM Mörch.					
783	S. nebulosum Dillwyn	....	.....	.....	.....	St. Augustine
	Genus VERMETUS Mörch.					
	Subgenus **Petaloconchus** Lea.					
784	P. erectus Dall	38	4	25. 0	$\frac{37}{8\,0\,5}$	Gulf of Mex .
785	P. irregularis Orbigny	....	.....	.....	.....	Cedar Keys..
	Genus BIVONIA Gray.					
786	B. exserta Dall	26	6	11. 0	$\frac{31}{1\,6\,0\,2}$	C. Lookout..
	Family TURRITELLIDÆ.					
	Genus TURRITELLA Lamarck					
	Section HAUSTATOR Montfort.					
787	T. variegata Linné	....	.....	.....	.....	Texas.....
788	T. yucatecana Dall	26	3	16. 5	640	Gulf of Mex.
	Section TORCULA Gray.					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	....	....	*	*	....	*	*	....	....	Barbados....	
....	..	....	....	....	†	†	....	†	....	....	....	Curaçoa.....	
....	*	*	....	*	*	*	*	*	*	....	....	Santa Cruz..	
....	..	....	..	....	*	*	*	*	....	....	....	Florida Str..	
....	..	....	..	*	*	*	....	*	....	....	....	Tortola	
....	..	....	..	....	†	†	....	†	....	....	....	Barbados....	
....	..	....	..	....	*	*	....	*	....	....	....	Guadalupe ..	
....	..	*	..	....	†	†	†	*	....	....	....	Barbados....	
....	..	....	..	....	....	....	*	*	....	....	....	Carthagena .	
....	..	....	..	....	....	....	†	†	....	....	....	Yucatan.....	
....	..	....	..	....	†	†	*	†	....	....	....	Barbados....	Pliocene.
....	..	†*	..	....	....	....	*	....	....	....	....	Texas	
....	..	*†	..	....	*	*†	....	†	....	....	....	Grenada.....	Pliocene.
....	..	....	†	....	....	....	†	†	....	....	....	Yucatan.....	
....	..	....	..	....	....	....	....	†	....	?	....	Barbados....	
....	..	....	†	†	....	....	....	....	....	....	....	Florida Str..	
....	..	†	†	....	....	....	....	....	....	....	....	Fernandina..	
....	..	....	†	....	....	....	....	....	....	....	....	.....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family LITORINIDÆ.					
	Genus LITORINA Férussac.					
	Section MELARAPHE Muhlfeldt.					
797	L. ziczac Dillwyn	....	.....	.....	.....	Florida Keys.
798	var. lineata Philippi	....	.....	.....	.....	Jupiter Inlet.
799	L. angulifera Lamarck	....	.....	.....	.....	Jupiter Inlet.
	Section LITORINA s. s.					
800	L. guttata Philippi	....	.....	.....	.....	Tortugas
801	L. mespilum Menke	....	.....	.....	.....	Texas.
802	L. irrorata Say	69	6	.....	.....	Rhode Island.
803	L. rudis Donovan	51 69	6 3	.....	.....	Arctic Ocean.
804	L. palliata Say	51	5	.....	.....	Nova Scotia.
	Genus LACUNA Turton.					
805	L. vincta Turton	52	19	.....	.....	Arctic Ocean.
	Subgenus Cithna A. Adams.					
806	C. tenella Jeffreys	....	.....	.....	1/2050	N. Atlantic.
	Genus TECTARIUS Valenciennes.					
807	T. muricatus Linné	...	.....	.....	.....	Jupiter Inlet.
	Genus ECHINELLA Swainson.					
808	E. nodulosa Pfeiffer	....	.....	.....	.....	C. Lookout.
	Family FOSSARIDÆ.					
	Genus FOSSARUS Philippi					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	...	*	....	*	*	*	....	....	Barbados....	
....	..	....	..	*	*	....	....	*	....	....	....	Guadalupe ..	
....	..	....	..	*	*	*	*	*	*	....	....	Carthagena .	
....	..	....	..	....	-	....	....	*	....	....	....	St. Thomas ..	
....	..	....	..	....	....	....	*	*	....	....	....	Barbados...	
*	..	*	*	*	....	*	*	*	....	....	....	Jamaica.....	
*	..	....	..	....	....	....	...	....	....	*	*	New Jersey..	P. Pliocene.
*	..	....	..	....	....	....	....	....	....	....	....	New Jersey..	P. Pliocene.
*	..	....	..	....	....	....	....	....	....	*	*	New Jersey..	P. Pliocene.
*	..	....	†	†	....	....	....	....	....	†	*	Brazil.....	Pliocene.
....	..	....	..	*	*	*	....	*	*	....	....	Aspinwall...	
....	..	*	..	*	*	....	*	*	*	....	....	Barbados....	
†	†	†	..	....	....	....	....	....	....	....	....	Cape Fear...	
....	..	†	..	....	*	....	....	....	....	....	....	Florida Keys.	
....	..	†	..	....	†	....	....	†	....	....	....	Cuba.....	
....	..	....	**	....	....	....	....	*	....	....	....	Jamaica	
....	..	....	..	....	*	*	....	*	....	....	....	Haiti	
....	..	....	†	....	....	....	....	†	....	....	....	Campeche Bk	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus LITIOPA Rang.					
815	L. bombyx Kiener				Pelagic.	Maine.
	Family SOLARIIDÆ.					
	Genus FLUXINA Dall.					
816	F. brunnea Dall	22	6, 6*a*	10.7	$\frac{80}{966}$	Florida Str.
817	*F. discula* Dall	23	5, 6	3.0	982	
	Genus SOLARIUM Lamarck.					
818	S. granulatum Lamarck					Hatteras
819	*S. peracutum* Dall	33	2, 5	6.0	$\frac{73}{180}$	
820	S. Sigsbeei Dall	23	3, 3*a*	2.3	310	Florida Str.
821	S. bisulcatum Orbigny				$\frac{14}{193}$	Hatteras
822	var. boreale Verrill	62	95*a*	12.0	$\frac{22}{249}$	Rhode Island
823	S. Krebsii Mörch				63	Hatteras
	Genus TORINIA Gray.					
824	T. canalifera C. B. Adams					Gulf of Mex.
825	T. cyclostoma Menke					Key West
826	T. cylindrica Gmelin					Gulf of Mex.
	Genus OMALAXIS Deshayes.					
827	O. nobilis Verrill	46	12	3.0	$\frac{70}{267}$	Chesapeake.
828	O. lamellifera Dall				205	Florida Str.
	Family RISSOIDÆ.					
	Genus RISSOA Fréminville.					
	Section CINGULA.					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
*	..	*	*	-	*	....	....	·	....	....	....	Brazil.....	P. Pliocene.
....	..	....	..	....	†	....	....	†	....	....	....	Jamaica	
....	..	....	..	....	....	....	....	†	....	....	....	Dominica ...	
....	..	†	..	....	....	....	*	†	....	....	*	Sombrero ...	
....	..	..	..	....	....	....	....	†	....	....	....	Barbados	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba.....	
...	..	†	†	†	....	....	....	*	....	....	....	Martinique ..	
?†	..	†*	..	†	...	....	....	†	....	....	....	Florida Str..	
....	..	†	..	....	...	....	....	*	....	....	....	Porto Plata .	
....	..	....	..	....	....	....	*	*	....	....	....	Guadalupe ..	
..	..	....	..	....	*	....	....	....	....	....	....	St. Thomas..	
....	..	....	..	....	....	....	*	....	....	....	....	St. Thomas..	
†	†	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	....	..	†	....	....	....	....	....	....	....	Cuba	
*	..	....	..	...	....	....	....	....	....	....	....	New Jersey..	
*	..	....	..	....	....	....	....	....	....	....	....	New York ..	
....	..	....	.	...	....	·	....	....	....	....	....	Gulf of Mex	
†	†	..	*	..	....	....	....	....	....	....	....	Hatteras	
†	†	..	†	..	....	....	....	†	....	....	....	Barbados....	
....	..		†	..	....	....	....	....	....	....	....	.....	
...	..		†	..	....	....	....	....	....	*†	....	Hatteras	
....	..		*†	†	†	....	....	....	....	....	....	Florida Str..	
...	..		†	..	....	....	....	....	....	....	....	Hatteras	P. Pliocene.
....	..	....	..	†	....	....	†	....	....	....	....	Yucatan	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
839	Rissoa ———	....	.....	....	6.3	Hatteras ....
840	R. acuticostata Dall	19	10	3.7	$\frac{32}{653}$	Hatteras ....
841	R. pyrrhias Watson	....	....	3.0	$\frac{8}{220}$	Florida Str ..
842	R. xanthias Watson	...	....	2.5	$\frac{8}{325}$	Florida Str ..
843	R. syngenes Verrill	....	.....	3.0	142	Hatteras ....
	Genus BENTHONELLA Dall.					
844	B. gaza Dall	42	5	6.5	$\frac{6}{763}$	Fernandina..
845	B. Fischeri Dall	....	.....	5.3	$\frac{240}{1060}$	Cedar Keys..
846	B. nisonis Dall	....	....	9.0	940	Gulf of Mex.
	Genus RISSOINA Orbigny.					
847	R. decussata Montagu	....	.....	.....	$\frac{5}{17}$	Cape Fear...
848	R. lævigata C. B. Adams	....	.....	.....	$\frac{9}{27}$	C. Lookout..
849	R. bryerea Montagu	....	.....	.....	$\frac{6}{18}$	Florida Keys
850	R. Chesnelii Michaud	....	.....	.....	.....	Hatteras ....
851	R. multicostata C. B. Adams	....	.....	.....	.....	Key Largo...
852	R. Sagraiana Orbigny	....	.....	.....	.....	Florida Str ..
853	R. cancellata Philippi	....	.....	.....	.....	Florida Keys
	Family ADEORBIDÆ.					
	Genus SKENEA Fleming.					
854	S. planorbis Fabricius	52	18	.....	.....	Arctic Sea...
	Genus ADEORBIS Wood.					
855	A. supranitidus Wood	41	7, 7a	.....	$\frac{1}{25}$	N. Atlantic ..
856	var. Orbignyi Fischer	....	.....	.....	$\frac{10}{103}$	Norway .....
857	A. Beaui Fischer	....	.....	.....	.....	Florida Keys

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	*†	†	†	....	....	....	Barbados....	
....	..	....	..	....	†	....	....	†	....	....	....	Culebra.....	
....	..	....	..	†	....	....	....	†	....	....	....	Brazil.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	....	†	†	....	†	†	†	....	....	....	Cuba.....	
....	..	....	..	....	....	†	†	†	...	....	....	Cuba.....	
....	..	....	..	....	....	†	....	....	....	....	....	Cedar Keys .	
....	..	*	..	....	*	*	....	*	....	....	....	Haiti	Pliocene.
....	..	*	..	....	*	*	....	*	....	....	....	St. Thomas..	Pliocene.
....	..	....	..	....	*	....	....	*	*	....	....	Barbados....	
....	..	*	..	....	*	*	....	*	....	....	....	Guadalupe ..	Pliocene.
....	..	....	..	....	*	....	....	*	....	....	....	Guadalupe ..	Pliocene.
....	..	....	..	....	*	....	*	*	....	....	....	Martinique..	
....	..	....	..	....	*	....	....	*	*	...	....	Haiti	
*	..	*	..	....	....	*	....	....	....	*	*	Charlotte H .	
....	..	*	..	....	....	*	....	....	....	*†	....	Cedar Keys .	Pliocene.
....	..	*	..	....	....	*	....	*†	....	*†	....	Guadalupe ..	Pliocene.
...	..	....	..	....	*	...	....	*	....	....	....	Guadalupe ..	
?†	..	....	..	....	....	....	....	....	....	....	....	Rhode Island	
....	..	*	..	....	....	....	....	†	....	....	....	Old Provid'ce	
....	..	....	*	*	*	*	*	*	....	....	....	Mexico.....	P. Pliocene.
....	..	....	..	....	....	*	*	*	....	....	....	Central Am...	
....	..	....	..	....	*	*	....	*	*	....	....	Cuba.....	
....	..	....	..	....	*	....	....	*	....	....	....	Haiti	
....	..	....	..	....	....	*	....	....	....	....	....	.....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Family TRUNCATELLIDÆ.					
	Genus TRUNCATELLA Risso.					
865	T. caribæënsis Sowerby					Alabama
866	T. bilabiata Pfeiffer					Sarasota
867	T. pulchella Pfeiffer					Tampa
868	T. subcylindrica Gray					Tampa
	Family ——————?					
	Genus SEPARATISTA Gray.					
	Subgenus **Haloceras** Dall.					
869	H. cingulata Verrill				200/1497	Gulf of Maine
	Family CHORISTIDÆ.					
	Genus CHORISTES Carpenter.					
870	*C. elegans* Carpenter	44	9*a–b*		143/640	Gulf of Me.?
	Family CALYPTRÆIDÆ.					
	Genus MITRULARIA Schumacher.					
871	M. equestris Linné				14/149	Hatteras
	Genus CRUCIBULUM Schumacher					
872	C. auricula Gmelin				34/171	Cedar Keys
873	C. striatum Say	50	27, 28		3/89	Nova Scotia

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
		....	..	....	*	*	?	*	.....	....	....	Guadalupe ..	
		....	..	....	*	*	....	*	....	....	....	Honduras ...	
		....	?	*	*	*	*	*	....	....	....	St. Thomas ..	
		....	..	....	*	*	....	*	*	....	....	St. Thomas ..	
†	?†	....	..	....	....	....	....	....	....	....	....	Delaware B .	
†?	..	....	..	....	....	....	....	....	....	....	....	Rhode Island	P. Pliocene.
....	..	*	..	....	*†	†	*	*	....	....	....	Barbados....	Pliocene.
....	..	....	..	...	*	*	*	*	....	....	....	Barbados....	Pliocene.
*	..	*	..	...	†	....	....	?	....	....	....	Florida Keys.	Pliocene.
....	..	*	.	*	*	*	....	*	....	....	....	Haiti.....	
*	*	*	-	*	-	*	-	*	....	....	....	Carthagena .	Miocene.
*	..	*	*	*	....	....	....	....	....	....	....	East Florida.	
*	*	*	-	*	-	*	*	-	*	?	....	Trinidad	Miocene.
....	..	*	*	*	-	*	*	*	*	....	....	Barbados....	Pliocene.
†	..	†	..	....	*	....	....	....	*	*†	....	Florida Keys.	Miocene.

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Section KREBSIA Mörch.					
880	Capulus intortus Lamarck	...	.....	.....	.....	Key West ...
	Section HYALORISIA Dall.					
881	*C. galea* Dall	14	3	18.5	218	Barbados ....
	Family AMALTHEIDÆ.					
	Genus AMALTHEA Schumacher.					
882	A. benthophila Dall	14	1*a*, *b*	8.0	$\frac{60}{373}$	Sand Key ....
883	A. antiquata Linné	....	.....	.....	.....	Turtle Harb.
884	A. subrufa Lamarck	....	.....	.....	.....	Key West ...
	Family XENOPHORIDÆ.					
	Genus XENOPHORA Fischer.					
885	X. conchyliophora Born	...	.....	.....	$\frac{14}{250}$	Hatteras ....
886	X. caribæa Petit	....	.....	.....	$\frac{14}{274}$	Hatteras ....
	Family NATICIDÆ.					
	Genus NATICA Lamarck.					
887	N. maroccana Dillwyn	....	.....	.....	.....	Hatteras ....
888	N. livida Pfeiffer	....	.....	.....	.....	Hatteras ....
889	N. canrena Lamarck	....	.....	.....	.....	Hatteras ....
890	N. castrensis Dall	....	.....	12.5	$\frac{27}{100}$	Key West ...
891	N. perlineata Dall			18.5	[illegible]	Gulf of Mex.

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
..	..	....	..	....	*	†	....	*	....	....	....	Barbados....	
...	..	....	..	....	....	....	....	†	....	...	....	.....	
.	.	....	..	....	†	....	....	†	....	....	....	St. Vincent..	
.	.	....	..	....	*	....	....	*	....	....	....	Aspinwall.	
.	.	....	..	....	*	....	....	*	....	....	....	Barbados....	
.	.	*	..	....	*†	†	....	†	*	....	....	Guadalupe ..	Eocene.
.	.	*	..	....	†	†	....	†	....	....	....	Barbados....	
...	..	†	..	....	....	†	....	†	*	*	....	Barbados....	Eocene.
....	..	†	..	....	†	†	....	†	....	....	....	Barbados....	
....	..	*	..	*	*	*	*	*	*	....	....	Carthagena ..	Pliocene.
....	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
*	..	*	*	*	*	*	....	....	....	....	....	Florida Keys .	
*	*	*	*	*	*	*	*	....	....	....	....	Vera Cruz ...	Miocene.
....	..	..	..	....	†	....	....	†	....	....	....	Barbados...	
*	*	*	?	...	....	....	....	....	....	....	....	Hog Isl'd, Va	Miocene.
*	..	†	..	...	....	....	....	....	....	....	....	Hatteras ...	Miocene.
*	..	*	..	...	....	....	....	....	....	....	....	Hatteras	
....	..	†	..	....	†	....	†	†	....	....	....	Cuba.....	
††	..	....	..	....	....	....	....	....	....	....	....	Rhode Islan	
....	..	....	..	*	....	*	....	*	....	....	....	Porto Rico .	
....	..	*	..	....	....	....	....	....	....	....	....	Hatteras ...	
....	..	....	†	†	†	....	†	†	....	....	....	Sombrero ...	
....	..	....	..	....	....	....	....	†	....	....	....	Old Provid'ce	
....	..	....	†	....	....	....	....	†	?	....	....	St. Vincent..	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Subgenus **Polynices** Montfort.					
905	P. uberina Orbigny				1/10	Hatteras
906	P. lactea Guilding					Florida Keys
907	P. brunnea Link					Tortugas
	Genus SIGARETUS Lamarck.					
908	S. perspectivus Say					New York
909	S. maculatus Say					Hatteras
910	S. minor Dall			4.0	2/24	Cape Florida
	Subgenus **Eunaticina** Fischer.					
911	E. carolinensis Dall			5.5	60/124	Hatteras
	Genus GYRODES Conrad.					
912	G. depressa Seguenza				1/1200	N. Atlantic
	Family LAMELLARIIDÆ.					
	Genus LAMELLARIA Montagu.					
913	L. Rangii Bergh					Gulf of Mex
914	L. pellucida Verrill	72	5		8/127	Rhode Island
	Genus MARSENINA Gray.					
915	M. ampla Verrill					Eastport
	Superfamily DOCOGLOSSA.					

[redacted]

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Ber-mu-da.	Eur.	West Am.	Southern extreme range.	Range in time.
		†			*	*		†				Sombrero	
					*	?	*	*				Brazil	
					*		*	*				Trinidad	
*	*	*		*	*	*	*	*				Martinique	
		*			*	*		*				Guadalupe	
					†	†		†				Sombrero	
		†											
		*†								*		C. Lookout	Pliocene.
										†			
							*						
†	†	*										Hatteras	
						*						Sarasota	
					*		*	*				Barbados	
					*			*				Barbados	
				*	*			*				Cuba	
					*	*		*				St. Thomas	
*										*	*	New York	P. Pliocene.
*											*	New York	P. Pliocene.
								†				St. Lucia	
†	†											Virginia	
††													
										†			

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus LEPETELLA Verrill.					
926	L. tubicola Verrill	25	6	3.75	130/147	Rhode Island
	Superfamily RHIPIDOGLOSSA.					
	Family SCUTELLINIDÆ.					
	Genus SCUTELLINA Gray.					
927	S. antillarum Shuttleworth	31	10, 11	.....	.....	Key West
	Family ADDISONIIDÆ.					
	Genus ADDISONIA Dall.					
928	A. paradoxa Dall	25 44 63	1, *a–e* 10, 11*a* 100*a*	12.0	50/640	Rhode Island
	Family COCCULINIDÆ.					
	Genus COCCULINA Dall.					
929	C. Rathbuni Dall	25	5, 7, 7*a*	13.0	100/676	Rhode Island
930	C. Dalli Verrill	....	.....	6.0	317	Delaware
931	C. Beanii Dall	25 44	2, 4, 8 12	8.0	100/853	Rhode Island
932	C. reticulata Verrill	....	.....	2.6	70	Chesapeake
933	C. spinigera Jeffreys	31	7, 8, 9	2.0	324/845	N. Atlantic
934	C. leptalea Verrill	63	101	4.0	324/2033	Rhode Island
	Family PHASIANELLIDÆ.					
	Genus PHASIANELLA Lamarck.					

TABLE V. E.—*List of Gastropoda*—Continued.

N.J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
†	†	....	†	....	....	†	....	....	....	†	....	Cedar Keys..	
....	..	....	..	....	*	....	....	*	....	....	....	St. Thomas..	
†	†	....	..	....	....	....	...	....	....	?†	....	Chesapeake .	
?†	..	....	..	....	....	....	....	†	....	....	....	Barbados....	
†	..	....	..	....	....	....	....	....	....	....	....	.....	
†	..	....	†	....	....	....	....	†	....	....	....	Barbados....	
†	†	*	..	....	....	....	....	....	....	....	....	Hatteras	
....	..	†	..	....	....	....	....	....	....	†	....	Hatteras ...	
†	†	†	†	....	....	....	....	....	....	....	....	Fernandina .	
....	..	†*	..	....	†	....	....	†	....	....	....	Martinique..	
....	..	*	..	....	*	....	....	*	*	....	....	Guadalupe ..	
....	..	....	..	....	*	*	....	*	*	...	....	St. Thomas..	
....	.	....	..	†	....	....	....	*	....	....	....	Guadalupe ..	
....	..	....	..	....	*	....	....	....	....	....	....	.....	
....	..	*	..	....	*	*	....	*	....	....	....	Trinidad	
....	..	*	..	*	*	*	....	*	....	....	....	Barbados....	
....	.	....	..	....	*	....	....	*	....	....	....	Tortola.....	
....	..	....	..	....	*	....	....	*	....	....	....	St. Lucia....	
....	..	....	..	*	*	....	....	*	....	....	....	Martinique ..	
....	..	....	..	....	*	....	....	*	*	....	....	Barbados....	
....	..	....	..	....	*	....	....	*	....	....	....	Aspinwall ...	
....	..	....	..	....	*	....	....	*	....	....	....	Carthagena..	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus LEPTOTHYRA Carpenter.					
948	L. induta Watson	38	6	7.0	$\frac{14}{1805}$	Hatteras
949	*L. Philipiana* Dall	34	7, 7*a*	3.5	138	
950	L. Linnæi Dall	33	9	5.5	$\frac{110}{805}$	Florida Str.
	Family TROCHIDÆ.					
	Genus OMPHALIUS Philippi.					
951	*O. excavatus* Lamarck					Florida Str.
952	O. fasciatus Born					Texas
953	O. indusii Gmelin					Key West
954	O. Hotessierianus Orbigny					Florida Str.
	Genus LIVONA Gray.					
955	L. pica Linné					Charlotte H.
	Genus GAZA Watson.					
956	G. superba Dall	22	4, 4*a*	32.0	$\frac{318}{321}$	Gulf of Mex.
957	G. Fischeri Dall	37	6	16.0	$\frac{423}{426}$	Gulf of Mex.
	Subgenus Callogaza Dall.					
958	C. Watsoni Dall	22 23 24	7, 7*a* 1, 1*a* 2, 2*a*	7.75 8.0 6.0	$\frac{84}{640}$	Gulf of Mex.
	Genus MICROGAZA Dall.					
959	M. rotella Dall	22	5, 5*a*	4.0	$\frac{73}{805}$	Hatteras
	Genus UMBONIUM Link.					
960	U. Bairdii Dall	21	6, 6*a*	4.0	$\frac{200}{640}$	Florida Keys
	Genus TEINOSTOMA Adams.					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	†	†	..	*†	....	†	†	....	....	....	Martinique..	
....	..	....	..	..	....	....	....	†	...	....	....	Dominica ...	
....	..	....	..	..	†	....	....	†	....	....	....	Barbados....	
...	..	....	..	..	†	....	....	*	....	....	....	Guadalupe ..	
....	..	....	..	..	*	....	....	....	....	....	....	Trinidad	
....	..	....	..	..	*	....	....	....	....	....	....	Santa Cruz..	
....	..	....	..	†	*†	....	....	*	....	.. .	....	Guadalupe ..	
....	..	....	..	..	*	*	....	*	*	....	....	Aspinwall...	
....	..	....	..	..	....	†	...	†	....	....	....	Barbados....	
....	..	....	..	..	....	†	....	†	....	....	....	St. Lucia....	
....	..	....	..	..	†	†	....	†	....	....	....	Barbados....	
....	..	†	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	†	....	....	†	....	....	....	Yucatan.....	
....	..	....	..	....	*	....	....	*	....	....	....	St. Thomas..	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	....	†	....	....	....	....	†	....	....	....	Barbados....	
....	*†	....	*	....	....	....	....	*	....	....	....	Haiti	
....	..	....	..	....	....	†	....	†	....	....	....	Cuba.....	
....	..	....	†	....	....	....	....	....	....	....	....	S. E. Florida.	
....	..	*†	..	....	....	....	....	....	....	....	....	Cape Fear...	
....	..	....	..	....	....	*	....	....	....	....	....	Gulf of Mex.	
....	..	....	..	....	....	....	....	†	....	....	....	St. Lucia....	
....	..	....	*†	....	....	....	....	†	....	....	....	Guadalupe ..	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon	Range in depth.	Northern extreme range.
	Genus COCHLIOLEPIS Stimpson.					
971	C. parasitica Stimpson	....	.....	.....	.....	S. Carolina..
972	C. striata Stimpson	....	.....	1.5	.....	Tampa .....
	Genus CALLIOSTOMA Swainson.					
973	C. euglyptum A. Adams	....	.....	.....	$\frac{5}{312}$	Hatteras ....
974	C. Bairdii V. & S	63	96	.....	$\frac{56}{640}$	Rhode Island
975	*C. aurora* Dall	37	2	21.0	$\frac{140}{876}$	.....
976	C. circumcinctum Dall	22	3, 3*a*	8.0	$\frac{240}{805}$	Gulf of Mex.
977	C. echinatum Dall	21	2*a*, 5	5.25	80	Gulf of Mex.
978	C. sapidum Dall	21	2, 4	5.0	805	Gulf of Mex.
979	C. corbis Dall	33	1	5.0	$\frac{220}{430}$	Gulf of Mex.
980	C. tiara Watson	....	.....	.....	$\frac{220}{780}$	Gulf of Mex.
981	C. roseolum Dall	24	6, 6*a*	9.5	$\frac{21}{200}$	Hatteras ....
982	C. apicinum Dall	24	3, 3*a*	7.5	$\frac{72}{175}$	Gulf of Mex.
983	C. pulcher C. B. Adams	....	.....	.....	$\frac{15}{63}$	Hatteras ....
984	C. orion Dall	28	2	4.5	80	Florida Str..
	Section EUCASTA Dall.					
985	*C. indiana* Dall	32	3, 5	8.3	170	.....
	Section EUTROCHUS A. Adams.					
986	C. jujubinum Gmelin	....	.....	.....	.....	Hatteras ....
987	var. Tampaënsis Conrad	....	.....	.....	.....	Hatteras ....
988	var. Rawsoni Dall	....	.....	.....	.....	Cedar Keys..
989	C. yucatecanum Dall	24	4, 4*a*	7.0	$\frac{15}{42}$	Cape Fear...
990	C. Sayanum Dall	33	10, 11	37.0	$\frac{107}{120}$	Hatteras ....
991	C. Benedicti Dall	32	7	14.0	200	C. Lookout..

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time
....	..	*	..	....	*	*	....	....	....	....	....	Florida Keys	
....	.	....	..	....	....	*	....	....	....	....	....	Gulf of Mex.	
....	..	*	*	*	*	*	*	....	....	....	....	Vera Cruz...	
†	†	*†	..	†	†	....	....	†	....	....	....	Florida Keys	
....	..	....	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	*	....	†	†	....	....	....	Yucatan	
....	..	....	..	....	*	....	....	*	....	....	....	Cuba.....	
....	..	....	..	....	*	....	....	*	....	....	...	Cuba	
....	..	....	..	....	†	†	....	†	....	....	....	Jamaica	
....	..	....	..	....	†	....	†	†	†	....	....	Dominica ...	
....	..	†	..	†	†	*	†	†	....	....	....	Yucatan	
....	..	....	..	....	†	....	....	†	....	....	....	Barbados....	
....	..	*†	..	....	*	....	*	*	....	....	....	St. Thomas..	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba.....	
....	..	....	..	....	....	....	....	†	....	....	....	Grenada	
....	..	*	*	*	*	*	*	*	....	....	....	Carthagena .	Pliocene.
....	..	*	*	*	*	*	....	*	....	....	....	Honduras ...	
....	..	....	..	....	....	*	...	*	....	....	....	Mauritius ...	
....	..	*	..	....	....	*	....	*	....	....	....	Yucatan	
....	..	†	..	....	....	....	....	....	....	...	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba	
....	..	†	..	....	†	†	....	†	....	....	....	Barbados....	
....	..	....	..	....	....	....	....	†	....	....	....	Barbados....	
....	..	....	..	....	....	....	....	†	....	....	....	Grenada	
....	..	....	..	....	†	....	....	†	....	....	....	Haiti	
....	..	....	..	....	†	....	....	†	....	....	....	Cuba.....	
....	..	....	..	....	†	....	....	†	....	....	....	Culebra	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Subgenus **Solariella** A. Adams.					
999	S. amabilis Jeffreys	....	.....	.....	193/858	Norway
1000	S. lamellosa V. & S	63	98	.....	16/192	Rhode Island
1001	*S. obscura* Couthouy	52	16	.....	10/467	Arctic Sea
1002	S. ægleis Watson	....	.....	.....	320/640	Fernandina
1003	var. lata Dall	....	.....	.....	213/808	Florida Str.
1004	var. rhina Watson	....	.....	.....	384/1000	Florida Str.
1005	var. clavata Watson	....	.....	.....	320/808	Florida Str.
1006	S. infundibulum Watson	....	.....	.....	769/1600	Delaware
1007	S. Ottoi Philippi	44 63	14) 97)	.....	64/1358	Hebrides
1008	S. scabriuscula Dall	21	10, 10*a*	4.75	539	Gulf of Mex.
1009	S. lissocona Dall	21	8, 8*a*	5.5	337/431	Cedar Keys.
1010	S. lacunella Dall	21	1, 1*a*	4.5	10/124	C. Hatteras.
1011	var. depressa Dall	....	.....	.....	805	Gulf of Mex.
1012	S. iris Dall	21	7, 7*a*	5.0	119	Florida Keys.
1013	S. ———	....	.....	.....	294	Fernandina
1014	S. ———	....	.....	.....	169	Cedar Keys.
1015	S. lubrica Dall	21	9, 9*a*	4.0	115/805	Cedar Keys.
1016	var. iridea Dall	....	.....	3.8	193	Cape Florida.
	Genus EUCHELUS Philippi.					
1017	E. guttarosea Dall	33	7	5.0	16/450	Florida Str.
1018	E. eucosta Dall	....	.....	.....	440	Georgia

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	†	†	....	†	....	*	....	St. Lucia....	
....	..	*†	..	....	....	....	....	†	....	....	....	Barbados ...	
††	..	....	..	....	....	....	....	....	....	*†	*	Rhode Island	
....	..	....	†	....	....	†	....	†	....	....	....	St. Vincent..	
....	..	....	..	†	†	....	....	†	....	†	....	Martinque...	Pliocene.
....	..	....	..	....	†	....	....	†	....	†	....	St. Vincent..	
....	..	....	..	....	†	....	....	†	....	....	....	Brazil.....	
†	†	....	..	....	†	....	....	†	†	....	....	Brazil.....	
†	†	....	..	....	....	....	....	†	....	†	....	St. Thomas..	Pliocene.
....	..	....	..	....	†	....	....	†	....	....	....	Cuba	
....	..	....	..	....	†	†	....	....	....	....	....	Gulf of Mex.	
....	..	†	..	....	†	....	....	†	....	....	....	Santa Cruz..	
....	..	....	..	....	†	....	....	....	....	....	....	Florida Keys.	
....	..	....	..	....	†	....	....	....	....	....	....	Florida Str..	
....	..	....	†	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	....	†	....	....	....	....	....	Gulf of Mex.	
....	..	....	..	....	†	†	....	†	....	....	....	St. Lucia....	
....	..	....	..	....	†	†	....	....	....	....	....	Gulf of Mex.	
....	..	....	..	....	†	....	....	*†	....	....	....	Haiti.....	
....	..	....	†	....	....	....	....	....	....	....	....	.....	
....	..	....	..	....	....	†	....	†	....	....	....	Brazil.....	
....	..	....	..	....	†	....	....	†	....	....	....	Tobago	
....	..	....	..	....	....	†	....	....	....	....	....	Australia....	
....	..	....	†	....	*	....	....	†	. .	. .	....	Culebra	
....	..	....	..	....	....	....	†	†	. .	. .	....	Yucatan.....	
....	*	....	..	....	*	....	....	*	. .	. .	....	Honduras .:.	
....	..	....	..	....	*	....	....	*	. .	. .	....	St. Thomas..	
....	..	....	..	....	†	....	....	†	. .	. .	....	Barbados....	
....	..	....	..	....	†	....	....	†	. .	. .	....	Barbados....	
....	..	....	..	....	†	....	....	†	. .	. .	....	Barbados....	
....	..	†	†	....	*†	....	....	†	. .	. .	....	Havana.....	
....	..	....	..	....	†	....	....	†	. .	. .	....	Florida Str..	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
1031	Liotia tricarinata Stearns	....	.....	.....	$\frac{13}{23}$	Hatteras ....
1032	L. miniata Dall	28	11	2.0	15	Florida Str..
1033	L. variabilis Dall	23	2, 2*a*	4.5	$\frac{22}{220}$	Hatteras ....
1034	var. *microforis* Dall	....	.....	.....	$\frac{54}{170}$	Cuba.....
	Subgenus **Lippistes** Montfort.					
1035	L. acrilla Dall	32	6, 11	2.0	.....	Garden Key .
1036	L. amabilis Dall	32	9, 12	2.0	80	Florida Str..
	Subgenus **Laxispira** Gabb.					
1037	L. nitida Verrill	46	11	5.0	1423	N. lat. 38°...
	Family CYCLOSTREMATIDÆ.					
	Genus VITRINELLA C. B. Adams.					
1038	V. multicarinata Stimpson	....	.....	1.5	15	Hatteras ....
1039	V. interrupta C. B. Adams	....	.....	.....	.....	Tampa.....
	Genus CYCLOSTREMA Marryat.					
1040	C. trochoides Jeffreys	....	.....	2.0	$\frac{36}{203}$	N. Atlantic..
1041	C. fulgidum Jeffreys	63	99	2.0	$\frac{487}{626}$	Gulf of Maine
1042	C. ornatum Verrill	....	.....	.....	$\frac{15}{843}$	Hatteras ....
1043	*C. cingulatum* Verrill	....	.....	2.0	547	N. lat. 40°..
1044	C. valvatoides Jeffreys	....	.....	.....	$\frac{108}{1024}$	C. Lookout..
1045	C. diaphanum Verrill	....	.....	2.5	$\frac{98}{203}$	Rhode Island
1046	C. turbinum Dall	33	5	2.75	80	Florida Str..
1047	C. pompholyx Dall	28	9	3.0	$\frac{204}{805}$	Fernandina .
1048	C. cistronium Dall	....	.....	1.6	$\frac{23}{63}$	Hatteras ....
1049	C. cancellatum Jeffreys	....	.....	2.5	$\frac{394}{1100}$	N. Atlantic..

TABLE V. E.—*List of Gastropoda*—Continued.

N.J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Ber-mu-da	Eur.	West Am.	Southern extreme range.	Range in time.
						*						Tampa	Pliocene.
				*				*				Barbados	
					†			†				Barbados	
								†				Grenada	
					*							Florida Str.	
					†			†				Cuba	
†													
						*						Florida	
						*		*				Jamaica	
		†				†		†		†		Old Provid'ce	
†												Fernandina	
		*†										Fernandina	
††												Rhode Island	
		†	†		†			†				Cuba	
†		†	†									Fernandina	
					†			†				Cuba	
					†			†				Cuba	
												Cape Fear	
								†				Yucatan	
					†			†				Cuba	
										*†		Fernandina	Pliocene.
				*	*		*	*	*			St. Vincent	
				*	*	*	*	*	*			Aspinwall	
					*			*				Aspinwall	
					*	*		*	*			Aspinwall	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus NERITINA Lamarck.					
1056	N. reclivata Say	....	.....	.....	.....	St. Augustine
1057	var. palmæ Dall	....	.....	.....	.....	Palma Sola..
1058	N. virginea Linné	....	.....	.....	.....	Tampa .....
1059	N. pupa Linné	....	.....	.....	.....	Charlotte H.
1060	N. viridis Lamarck	....	.....	.....	.....	No Name Key
	Section THEODOXUS Montfort.					
1061	N. Showalteri Lea	....	.....	.....	Fluv.	Alabama ....
	Family STOMATIIDÆ.					
	Genus STOMATELLA Lamarck.					
1062	S. picta Orbigny	....	.....	.....	.....	Florida Keys
	Superfamily ZYGOBRANCHIA.					
	Family HALIOTIDÆ.					
	Genus HALIOTIS Linné.					
1063	H. Pourtalesii Dall	....	.....	.....	200	Florida Str..
	? Family SCISSURELLIDÆ.					
	Genus SCISSURELLA Orbigny.					
1064	S. crispata Fleming	48	15	.....	$\frac{1}{7\,9\,0}$	Norway .....
1065	S. alta Watson	....	.....	.....	$\frac{1}{2\,0\,0}$	Florida Str..
1066	S.———	....	.....	.....	$\frac{2\,2\,1}{4\,3\,4}$	Fernandina .
	Family PLEUROTOMARIIDÆ.					
	Genus PLEUROTOMARIA Sow-					

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
									*				
....	..	....	*	*	....	*	*	*	....	....	....	Jamaica.....	
....	..	....	..	....	....	....	*	....	....	....	....	.....	
....	..	...	..	....	*	*	*	*	....	....	....	Brazil.....	
....	..	....	..	....	*	*	....	*	....	....	....	Jamaica.....	
....	..	....	..	....	*	....	*	*	*	....	....	Barbados....	
....	..	..	..	....	....	*	....	....	....	....	....	.....	
....	..	....	..	....	*	....	....	*	....	....	....	St. Barts	
....	..	....	..	....	†	....	....	†	....	....	....	.....	
†	†	....	†	....	....	....	....	....	....	*†	....	Fernandina .	Pliocene.
....	..	....	..	†	....	....	....	†	....	....	....	Barbados....	
....	..	....	†	....	....	....	....	....	....	....	....	St. Augustine	
....	..	....	..	....	....	....	†	†	....	....	....	Barbados....	
....	..	....	..	....	....	....	....	†	....	....	....	Barbados....	Pliocene. †
....	..	....	..	....	†	....	....	†	....	....	....	Florida Str ..	
....	..	....	..	....	....	....	†	†	....	....	....	Yucatan.....	
....	..	....	..	....	....	....	†	†	....	....	....	Barbados....	
....	..	....	†	....	....	....	....	†	....	....	....	Culebra.....	
....	..	....	..	†	....	....	....	†	....	....	....	Culebra.....	
††	..	....	..	....	....	....	....	....	....	....	....	.....	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
1075	Puncturella sportella Watson	....	.....	.....	380/430	N. lat. 24°...
1076	P. abyssicola Verrill	....	.....	10.0	1537	N. lat. 39°...
1077	P. erecta Dall	....	.....	7.0	107	Hatteras ....
	Subgenus **Fissurisepta** Seguenza.					
1078	F. triangulata Dall	....	.....	.....	300/390	Fernandina .
1079	F. rostrata Seguenza	....	.....	.....	.....	N. Atlantic ..
	Subgenus **Cranopsis** Adams.					
1080	C. asturiana Fischer	....	.....	.....	.....	N. Atlantic ..
	Genus EMARGINULA Lamarck.					
	Subgenus **Rimula** Defrance.					
1081	R. frenulata Dall	28	4	2.3	6/52	Hatteras ....
	Subgenus **Subemarginula** Blainville.					
1082	S. octoradiata Gmelin	....	.....	.....	.....	Tortugas ....
1083	S.———	....	.....	.....	300	Gulf of Mex.
	Subgenus **Emarginula** s. s.					
1084	E. tumida Sowerby	....	.....	.....	.....	Gulf of Mex.
1085	E. pumila A. Adams	....	.....	.....	10/16	Turtle Harb.
1086	E. cancellata Philippi	....	.....	.....	28/37	Britain .....
1087	E. compressa Cantraine	....	.....	.....	64/640	Portugal ....
	Genus FISSURELLA Bruguière.					
1088	F. alternata Say	....	.....	.....	1/10	Hatteras ....
1089	var. Sayi Dall	....	.....	.....	60/94	Florida Str..
1090	F. nodosa Born	....	.....	.....	.....	Tortugas ....

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	†	....	....	....	†	....	....	....	Culebra.....	
†	..	....	..	....	....	....	....	....	....	....	....	.....	
....	..	†	..	....	....	....	....	....	....	....	....	.....	
....	..	....	†	....	....	....	†	†	....	....	....	Culebra.....	
....	..	....	†	....	....	....	....	....	....	†	....	Fernandina .	Pliocene.
....	..	†	†	....	†	....	....	†	....	†	....	St. Barts	Pliocene.
....	..	†	..	....	*	....	....	....	....	....	....	Tortugas....	
....	..	....	..	....	*	....	....	*	....	....	....	Barbados ...	
....	..	....	..	....	....	....	†	†	....	....	....	Cuba.....	
....	..	....	..	....	*	....	....	*	....	*	....	Cuba.....	
....	..	....	..	....	*	....	....	*	....	....	....	Haiti	
....	..			..	†	....	....	*†	*	†*	....	Barbados....	
....	..			..	*	....	....	†	....	†	....	Barbados....	Pliocene.
....	..			*	*	*	....	*	*	....	....	Barbados....	Pliocene.
....	..			..	†	....	....	†	....	....	....	Barbados....	
....	..			..	*	....	....	*	*	....	....	Barbados....	
....	..			..	*	....	....	*	*	....	....	Barbados....	
....	..			..	....	*	....	†	*	....	....	St. Lucia....	Pliocene.
....	..	....		....	*	....	....	*	*	....	....	Guadalupe ..	
....	..	....	..	....	*	*	....	*	*	....	....	Barbados....	
....	..	....	..	....	*	....	....	*		....	....	St. Barts	
†	†	†	..	....	....	....	....	....		....	....	Hatteras	
....	..	....	..	....	†	....	....	†			....	Barbados....	
....	..	†	..	....	....	...	....	....			....	.....	
....	..	....	..	....	*	....	....	....			....	.....	
....	..	....	..	....	†	....	....	†			....	Barbados....	
....	..	*	..	....	*	....	....	†			....	Barbados...	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
1102	Fissurellidea fasciata Pfeiffer	....	.....	.....	.....	Gulf of Mex..
1103	F. pustula Linné	....	.....	.....	.....	C. Lookout..
	Genus CLYPIDELLA Swainson.					
1104	C. fascicularis Lamarck	....	.....	.....	.....	Key West....
	Subclass ISOPLEURA.					
	Order POLYPLACOPHORA.					
	Superfamily EOCHITONIA.					
	Family LEPTOCHITONIDÆ.					
	Genus LEPTOCHITON Gray.					
1105	*L. alveolus* Sars	....	.....	.....	$\frac{100}{640}$	Arctic Sea...
1106	L. pergranatus Dall	....	.....	.....	$\frac{1}{1151}$	Gulf of Mex.
	Genus HANLEYIA Gray.					
1107	H. tropicalis Dall	26	8*c*.8*d*.	4.0	128	Sand Key ...
1108	H. mendicaria Mighels	....	.....	.....	$\frac{40}{2117}$	Arctic Sea ..
	Family ISCHNOCHITONIDÆ.					
	Genus TRACHYDERMON Carpenter.					
1109	T. exaratus Sars	45	2, 2*a*	.....	$\frac{100}{273}$	Norway .....
1110	T. ruber Lowe	51	9	.....	$\frac{5}{50}$	Arctic Sea...
	Genus CHÆTOPLEURA Shuttleworth.					
1111	C. apiculata Sowerby	51	10	.....	$\frac{0}{30}$	Cape Cod ...
1112	C. Janeirensis Gray					Key West

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Bermuda.	Eur.	West Am.	Southern extreme range.	Range in time.
....	..	....	..	....	*	*	....	*	....	....	.....	Cuba	
....	..	*	..	....	?	.....	....	*	....	....	.....	Barbados....	
....	..	....	..	....	*	.....	....	*	....	....	.....	Jamaica.....	
†	..	....	?	....	....	.....	....	.....	....	†	†	Gulf of Me. ?	
....	..	....	..	....	†	†	....	†	....	....	.....	Dominica ...	
....	..	....	..	....	†	.....	....	.....	....	....	.....	Florida Str..	
†	..	†	..	....	....	.....	....	.....	....	†	.....	Hatteras	
...	..	†	†	....	....	.....	....	.....	....	†	.....	Fernandina..	
*	..	....	..	....	....	.....	....	.....	....	*	*	New York ...	
*	*	*	*	*	*	*	....	*	....	....	.....	Haiti.....	
....	..	....	..	....	*	.....	....	*	....	....	.....	Rio Janeiro..	
....	..	....	..	....	*	.....	....	*	....	....	*	St. Vincent .	
....	..	....	..	....	*	.....	*	*	*	....	.....	St. Thomas..	
...	..	....	..	....	*	*	....	*	....	....	.....	St. Thomas .	
....	..	....	..	....	*	.....	*	*			.....	Yucatan.....	
....	..	....	..	....	*	.....	....	*			.....	St. Thomas..	
....	..	....	..	*	....	.....	....	*	....	....	.....	Trinidad	
....	..	....	..	....	*	.....	....	*	*	....	.....	Santa Cruz .	
....	..	....	..	....	....	.....	*	*	*	....	.....	Trinidad	

TABLE V. E.—*List of Gastropoda*—Continued.

Ser. No.	Name and authority for species.	Pl.	Figs.	Alt. or Lon.	Range in depth.	Northern extreme range.
	Genus TONICIA Gray.					
1121	T. Schrammii Shuttleworth	....	.....	.....	.....	Key West ...
	Family ACANTHOPLEURIDÆ.					
	Genus ACANTHOPLEURA Guilding.					
1122	A. picea Gmelin	....	.....	.....	.....	Charlotte H.
	Superfamily OPSICHITONIA.					
	Family PLACOPHORIDÆ.					
	Genus PLACOPHORA Gray (em.).					
1123	*P. atlantica* Verrill & Smith	45 63	1*a*, *b* 102*a*	32. 0	413	Off Cape Cod.
	Family MOPALIIDÆ.					
	Genus ACANTHOCHITON Leach.					
1124	A. astriger Reeve	....	.....	.....	.....	Tortugas ....
1125	A. spiculosus Reeve	....	.....	.....	.....	Cedar Keys..
	Genus NOTOPLAX H. Adams.					
1126	N. floridanus Dall	....	.....	.....	.....	Cape Florida
	Family AMICULIDÆ.					
	Genus AMICULA Gray.					
1127	*A. vestita* Sowerby	63	103*a*	.....	$\frac{10}{60}$	Arctic Sea...

TABLE VI. F.—*List of Cephalopoda.*

TABLE V. E.—*List of Gastropoda*—Continued.

N. J.	Va.	Hat.	Ga.	East Fla.	Fla. Keys.	West Fla.	Tex.	West Ind.	Ber. muda.	Eur.	West Am.	Southern extreme range.	Range in time.
					*	....	....	*	*	....	....	Guadalupe ..	
				....	*	*	....	*	*	....	....	New Grenada	
?	..	....	..	....	....	....	....	....	....	....	....	Rhode Island	
....		....	..	....	*	....	....	*	....	....	....	St. Thomas..	
....			..	....	*	*	....	*	....	....	....	Barbados....	
....				....	*	....	....	....	....	....	....	Key West ...	
†?	..	....	..	....	....	....	....	....	....	...	†	New York ?..	

TABLE VI. F.—*List of Cephalopoda.*

*	..	*	..	....	....	*	.....	*	....	?	*?	Brazil?.....	
*?	*?	?*	*?	?*	*†	*†	....	†	*?	....	....	Tropics?	

SUMMARY OF THE TABLES.

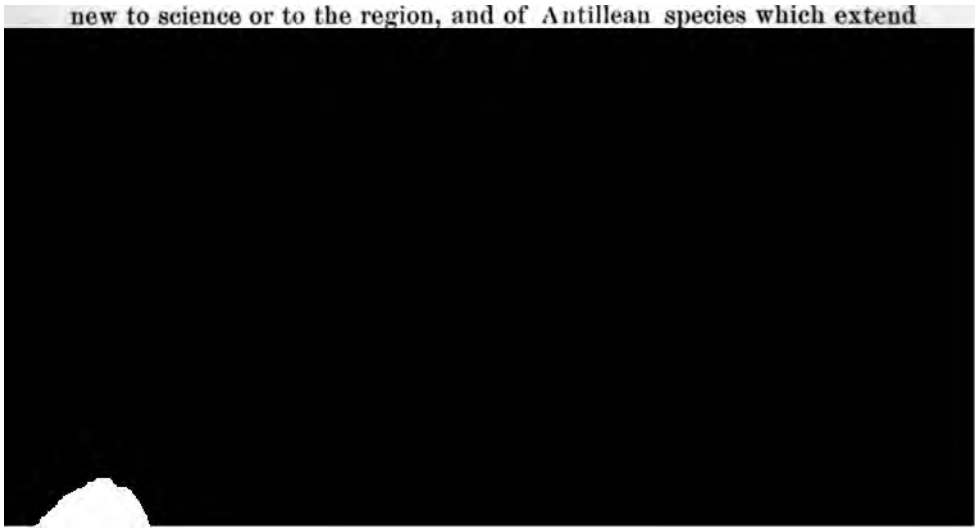
The following table shows the relative proportions of the different groups included in the fauna and enumerated in the tables preceding:

	In the tables.	Extra limital.
Brachiopods	21	2
Pelecypods	487	13
Scaphopods	44	2
Pteropods	33	3
Gastropods	1,127	59
Cephalopods	2	.....
Total	1,714	79
Deduct extra-limital species	79	.....
Total enumerated species from Sandy Hook to Florida and the Rio Grande	1,635	.....

It may be added that, with but few exceptions, the enumerated extra-limital forms are likely, with further exploration, to be found in our region.

If all the Nudibranchiata, Heteropoda, and Cephalopoda were enumerated the total would be at least eighteen hundred forms.

It is probable that some of the species enumerated in the tables will hereafter prove to be synonymous with other enumerated species. But there is a reasonable prospect of the discovery of deep-water species, new to science or to the region, and of Antillean species which extend



EXPLANATION OF THE PLATES.

NOTE.—The figures following the authority for the specific name denote the actual length in millimeters of the longest diameter of the figure, whether that be the height or the breadth, except where otherwise stated.

PLATE I.

FIG. 1. *Corbula Krebsiana* C. B. Adams; 6.1.
1 a. " "
1 b. " "
2. *Basterotia quadrata* Hinds; 10.0; left valve.
2 a. Same, hinge seen from above.
2 b. " " " " below.
3. *Corbula Knoxiana* C. B. Adams; 12.7; front.
3 a. " " back of left valve.
3 b. " "
3 c. " "
4. *Corbula disparilis* D'Orbigny; 9.0.
4 a. " "
4 b. " "
5. *Corbula Dietziana* C. B. Adams; 10.7.
5 a. " "
5 b. " "
6. *Corbula Kjoeriana* C. B. Adams; 12.0
6 a. " "
6 b. " "
7. *Corbula cymella* Dall; 13.5.
7 a. " "

All the above, except figures 2 a, 2 b, and 4 a, 4 b, are drawn by W. H. Dall with the camera lucida from typical specimens of the describer in the museum at Amherst.

The following plates (I–XL) are from the Report on the Mollusca of the Blake Expedition, parts I and II, drawn by J. C. McConnell (except where otherwise stated) from the specimens. For the use of these plates we are indebted to Prof. Alex. Agassiz.

PLATE II.

FIG. 1 a, 1 b. *Verticordia (Euciroa) elegantissima* Dall; 13.25.
2, 2 a. *Halonympha clavicula* Dall; 12.0.
3 a, 3 b. *Cardiomya perrostrata* Dall; 8.0.
4 a, 4 b. *Verticordia (Haliris) Fischeriana* Dall; 10.0.
5 a–5 c. *Corbula Swiftiana* C. B. Adams, from type; 10.4.
6 a–6 d. *Corbula Chittyana* C. B. Adams, from type; 8.5.
7, 7 a–c. *Corbula Barrattiana* C. B. Adams, from types; 8.9.

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PLATE III.

FIG. 1. *Cuspidaria obesa* Lovèn, var.? 13.0.
2. *Cuspidaria Jeffreysi* Dall; 15.0.
3. *Cuspidaria arcuata* Dall; 12.5; inside.
4. Same, outside.
5. *Myonera limatula* Dall; 11.15.
6. *Cardiomya pectinata* Cpr., var. *beringensis* Leche [N. W. coast of America]; 6.0
7. *Myonera lamellifera* Dall; 12.5.
8. *Leiomya (Plectodon) granulata* Dall; 11.0.
9. *Cardiomya corpulenta* Dall; 14.0.
10. *Cardiomya striata* Jeffreys; 19.0.

PLATE IV.

FIG. 1 a. *Pecten (Amusium) Dalli* E. A. Smith; 62.0; inside of lower valve.
1 b. The same, inside of upper valve.
2. *Pecten (Pseudamusium) Sigsbeei* Dall; 11.5.
3. *Pecten (Propeamusium) Pourtalesianus* Dall, var. *marmoratus*; 13.5.
4 a–b. *Pecten (Pseudamusium) imbrifer* Lovèn; 12.5.
5 a–b. *Dimya argentea* Dall; 12.0.
6. *Cardium (antillarum* Orb. var.?) *ceramidum* Dall; 8.2.
7. *Cardium peramabilis* Dall; 12.5.
8. *Abra lioica* Dall; 8.1.
9 a–b. *Saxicava azaria* Dall; 25.0.

PLATE V.

FIG. 1, 2. *Pecten (Propeamusium) cancellatus* E. A. Smith; 26.0.
1 a. The same; a bit of the sculpture enlarged.
3. *Pecten (Propeamusium) Sayanus* Dall; 15.5.
4. *Pecten caurinus* Gould, young valve; 6.0.
5. *Pecten (Propeamusium) Holmesii* Dall; 12.0.
6. *Hinnites Adamsi* Dall; upper valve; 28.0.
7, 7 a. *Pecten (Propeamusium) alaskensis* Dall; 22.8; West America.
8. *Pecten (Pseudamusium) reticulus* Dall; 7.0.
9. *Pecten (Propeamusium) Sayanus* Dall; 15.5.
10. *Pecten (Pseudamusium) reticulus* Dall; 7.0.

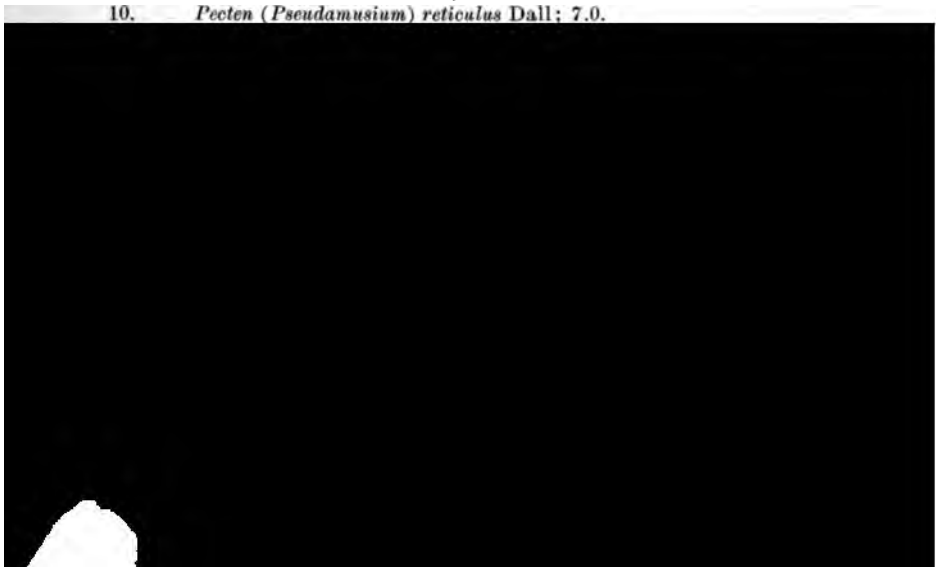


PLATE VII.

FIG. 1 a-b. *Leda (Neilonella) corpulenta* Dall; 9.5.
2. *Nucula crenulata* A. Adams; 6.0.
3 a-b. *Leda acuta* Conrad; 9.5.
4 a-b. *Gouldia cerina* C. B. Adams; 10.5; type.
5 a-b. *Astarte Smithii* Dall; 7.0.
6 a-b. *Astarte nana* (? Jeffreys) Dall; 8.2.
7 a-b. *Leda solidifacta* Dall; 12.5.
8. *Leda acuta* Conrad; 9.5.

PLATE VIII.

FIG. 1, a. *Tindaria cytherea* Dall; 8.6.
2. *Nucula* var. *obliterata* Dall; 6.0.
3, 3 a. *Arca polycyma* Dall; 9.75.
4, 4 a. *Macrodon asperula* Dall; 8.5.
5. *Arca pectunculoides*, var. *orbiculata*, Dall; 8.0.
6. *Leda (Saturnia) quadrangularis* Dall; 4.6.
7, 7 a. *Limopsis antillensis* Dall; 4.25.
8, 8 a. *Pandora (Clidiophora) carolinensis* Bush; 14.2.
9, 9 a. *Arca glomerula* Dall; 5.75.
10. *Cetoconcha margarita* Dall; 7.3.
11. *Leda Carpenteri* Dall; 10.5.
12, 12 a. *Leda ritrea*, var. *cerata*, Dall; 6.5.
13. *Vesicomya pilula* Dall; 2.6.

PLATE IX.

FIG. 1, 1 a. *Yoldia liorhina* Dall; 13.1.
2, 2 a. *Yoldia solenoides* Dall; 12.5.
3. *Leda Carpenteri* Dall; 10.5.
4. *Mangilia serga* Dall; 9.0.
5. *Mangilia citronella* Dall; 4.0.
6. *Mangilia Pourtalesii* Dall; 17.0.
7, 7 a. *Xylophaga abyssorum* Dall; 4.0.
8. *Conus Agassizii* Dall; 30.0; adult.
8 a. The same, young shell; 9.0.
9. *Daphnella leucophlegma* Dall; 10.25.
10. *Daphnella (Eubela) limacina* Dall; 11.0.

PLATE X.

FIG. 1. *Gymnobela Blakeana* Dall; 8.25.
2. *Gymnobela extensa* Dall; 12.25.
3. *Mangilia bandella* Dall; 9.37.
4. *Mangilia antonia* Dall; 5.75.
5. *Leucosyrinx Verrillii* Dall; 36.0.
6. *Drillia polytorta* Dall; 33.5.
7. *Drillia acentra* Dall; 19.0.
8. *Drillia albicoma* Dall; 25.7.
9. *Pleurotomella Emertonii* Verrill & Smith; 34.0.
10. *Daphnella reticulosa* Dall; 11.5.
11. *Daphnella sofia* Dall, outer lip imperfect; 8.0.
12. *Mangilia? scipio* Dall, outer lip imperfect; 14.0.

PLATE XI.

FIG. 1. *Drillia nucleata* Dall; 13.5.
2. *Drillia Verrillii* Dall; 5.5.
3. *Drillia lissotropis* Dall, young; 4.5.
4. *Drillia lissotropis* Dall, adult; 7.0.
5. *Drillia havanensis* Dall; 9.0.
6. *Drillia lithocolleta* Watson, young; 12.5.
7. *Drillia smirna* Dall; 15.0.
8. *Drillia oleacina* Dall; 10.0.
9. *Mangilia pelagia* Dall; 10.75.
10. *Leucosyrinx Sigsbeei* Dall; 25.5.
11. *Mangilia antonia* Dall, young; 7.0.
12. *Mangilia comatotropis* Dall; 6.0.
13. *Pleurotomella leucozonata* Dall; 13.5.
14. *Mangilia Agassizii* V. & S.; young shell of var. *mexicana* Dall; 8.5.
15. *Mangilia quadrata* var. *monocingulata* Dall; 6.75.
16. *Mangilia quadrata* var.; 7.0.
17. *Mangilia peripla* Dall; 8.0.
18. *Drillia premorra* Dall; 9.5.

PLATE XII.

FIG. 1. *Daphnella morra* Dall; 5.75.
2. *Drillia pharcida* Dall; 9.5.
3. *Mangilia? subsida* Dall; 13.0.
4. *Cythara cymella* Dall; 13.0.
5. *Genota mitrella* Dall; 12.5.
6. *Cythara Bartlettii* Dall, adult; 8.0.
7. *Mangilia elusiva* Dall; 9.25.
8. *Mangilia torcumata* Dall; 10.5.
9. *Pleurotomella filifera* Dall; 17.5.
10. *Glyphostoma gratula* Dall; 17.5.
11. *Drillia detecta* Dall; 11.75.

PLATE XIV.

FIG. 1. *Amalthea benthophila* Dall, on spine of Echinoderm, viewed from above; 8.0.
1 a. *Amalthea benthophila* Dall, from the right; 8.0.
1 b. *Amalthea benthophila* Dall, from below; 8.0.
2. *Loripes compressa* Dall; 11.0.
3. *Capulus* (*Hyalorisia*) *galea* Dall, from below; 18.5.
3 a. *Capulus* (*Hyalorisia*) *galea* Dall, profile; 18.5.
4. *Pleurotomella Packardii* var. *Benedicti* V. & S.; 11.0.
5. *Cythara Bartlettii* Dall, nearly adult; 10.0.
6. *Glyphis fluviana* Dall, from below; 10.6.
6 a. *Glyphis fluviana* Dall, profile; 10.6.
7. *Daphnella corbicula* Dall; 11.2.
8. *Cythara Bartlettii* Dall, young; 10.0.
9. *Umbraculum bermudense* Mörch? young shell; 10.0.
10. *Umbraculum bermudense* Mörch? profile; 10.0.

PLATE XV.

FIG. 1. *Murex Pazi* Crosse, young shell; 7.5.
2. *Trophon? actinophorus* Dall; 17.5.
3. *Pteronotus tristichus* Dall; 15.5.
4. *Trophon lacunella* Dall; 41.0.
5. *Dolium* (*Eudolium*) *Crosseanum* Monterosato; 35.0.
6. *Mitra* (*Costellaria?*) *styria* Dall; 19.0.
7. *Typhis* (*Trubatsa*) *longicornis* Dall, young; 7.5.
8. *Mitra* (*Thala?*) *torticula* Dall; 12.2.
9. *Mangilia? exsculpta* Watson; 30.0.
10. *Fusus benthalis* Dall; 15.0.
11. *Fusus amiantus* Dall; 17.0.
12. *Nassarina Bushiæ* Dall; 9.0.

PLATE XVI.

FIG. 1. *Ocinebra* (*Favartia*) *cellulosa* Conrad, young; 12.0.
2. *Murex pomum* Gmelin, very young; 15.0.
3. *Murex Hidalgoi* Crosse; 23.0.
4. *Murex hystricina* Dall; 21.0.
5. *Coralliophila Deburghiæ* Reeve, young; 20.0.
6. *Coralliophila lactuca* Dall, young; 11.0.

PLATE XVII.

FIG. 1. *Actæon incisus* Dall; 9.0.
1 b. *Actæon incisus* Dall var., adolescent; 6.8.
2. *Actæon melampoides* Dall; 6.0.
3. *Utriculus vortex* Dall; 7.5.
4. *Utriculus Frielei* Dall; 8.2.
5 *Actæon delicatus* Dall; 10.0.
6. *Bulla eburnea* Dall; 7.25.
7. *Atys? Sandersoni* Dall; 6.5.
8. *Utriculus* (*vortex* var.?) *domitus* Dall; 9.0.
9. *Sabatia bathymophila* Dall, adult; 16.5.
9 b. *Sabatia bathymophila* Dall, adolescent; 10.0.
10. *Scaphander Watsoni* Dall; 8.75.
11. *Bulla abyssicola* Dall; 12.75.
12. *Actæon Danaida* Dall; 11.0.

PLATE XVIII.

FIG. 1. *Scala hellenica* var. *Mörchiana* Dall; 6.87.
2. *Scala discobolaria* Dall; 6.5.
3. *Actæon perforatus* Dall; 7.75.
4. *Scala aurifila* Dall; 11.0.
5. *Niso interrupta* Sowerby var. *albida* Dall; 8.1.
6. *Niso interrupta* var. *albida* Dall, base; 3.5.
7. *Aclis nucleata* Dall; 9.3.
8. *Aclis lata* Dall; 5.5.
9. *Scalæ contorquata* Dall; 4.7.
10. *Scala polacia* Dall, aperture imperfect; 7.25.
11. *Scala formosissima* Jeffreys; 8.5. The aperture is a little distorted where it joins the body whorl.
11 b. *Scala belaurita* Dall; 8.3.
12. *Aclis egregia* Dall; 13.0.

PLATE XIX.

FIG. 1. *Rissoa precipitata* Dall; 4.0.
2. *Marginella seminula* Dall; 7.0.
3. *Marginella Watsoni* Dall; 9.5.
4. *Marginella fusina* Dall; 8.0.
5. *Marginella yucatecana* Dall; 5.62.
6. *Marginella succinea* Conrad; 12.0.
7. *Marginella torticula* Dall; 11.5.
8. *Columbella* (*Anachis*?) *Verrillii* Dall; 9.0.
9. *Pedicularia decussata* Gould, profile; 6.0.
9 b. *Pedicularia decussata*, young, showing spiral apex; 2.5.
10. *Rissoa xanthias* Watson, var. *acuticostata* Dall; 3.7.
10 b. *Eucosmia brevis* Orbigny; 2.0.
10 c. *Columbella* (*Anachis*) *amphissella* Dall; 4.0.
10 d. *Dalium solidum* Dall; 41.0.
11. *Eulima* (*Melanella*) *arcuata* C. B. Adams; 4.0.

PLATE XXI.

FIG. 1. *Solariella lacunella* Dall; base, 5.0.
1 a. *Solariella lacunella* Dall; profile, 4.5.
2. *Calliostoma rapidum* Dall; 5.0.
2 a. *Calliostoma echinatum* Dall; base, 4.75.
3. *Dillwynella modesta* Dall; top, alt. 3.0.
3 a. *Dillwynella modesta* Dall; profile, diam. 4.0.
4. *Calliostoma rapidum* Dall; base, 4.12.
5. *Calliostoma echinatum* Dall; 5.25.
6. *Umbonium Bairdii* Dall, young specimen; profile, alt. 4.0.
6 a. *Umbonium Bairdii* Dall; base, diam. 5.0.
7. *Solariella iris* Dall; profile, 5.0.
7 a. *Solariella iris* Dall; base, 5.5.
8. *Solariella lissocona* Dall; profile, 5.5.
8 a. *Solariella lissocona* Dall; base, 4.5.
9. *Solariella lubrica* Dall; profile, 4.0.
9 a. *Solariella lubrica* Dall; base, 3.25.
10. *Solariella scabriuscula* Dall; base, 4.0.
10 a. *Solariella scabriuscula* Dall; profile, 4.75.
11. *Lunatia fringilla* var. *perla* Dall; 6.5.
12. *Lunatia fringilla* Dall; 5.75.

PLATE XXII.

FIG. 1. *Turcicula imperialis* Dall, immature shell without the apical whorls; 13.0.
1 a. *Turcicula imperialis* Dall; base, 13.0.
2. *Basilissa alta* Watson, var. *delicatula* Dall; alt. 5.0.
2 a. *Basilissa alta* Watson, var. *delicatula* Dall; base, diam. 6.0.
3. *Calliostoma circumcinctum* Dall; diam. 6.9.
3 a. *Calliostoma circumcinctum* Dall; alt. 8.0.
4. *Gaza superba* Dall; profile, alt. 24.0.
4 a. *Gaza superba* Dall; base, diam. 35.5.
5. *Microgaza rotella* Dall; base, diam. 6.75.
5 a. *Microgaza rotella* Dall; profile, alt. 4.0.
6. *Fluxina brunnea* Dall; profile, alt. 10.75. The margins of the aperture are broken.
6 a. *Fluxina brunnea* Dall; base, diam. 15.5.
7. *Callogaza Watsoni* Dall; profile, alt. 7.75.
7 a. *Callogaza Watsoni* Dall; base, diam. 12.5.

PLATE XXIII.

FIG. 1. *Callogaza Watsoni* Dall, young; 8.0.
1 a. *Callogaza Watsoni* Dall, young; 8.0.
2. *Liotia variabilis* Dall; base, diam. 6.0. A calcareous foraminifer is attached to the periphery.
2 a. The same in profile, alt. 4.5.
3. *Solarium Signbeei* Dall; diam. 5.5. Margin of aperture defective.
3 a. The same in profile, alt. 2.3.
4. *Basilissa costulata* Watson var. *depressa* Dall; base, diam. 5.0.
4 a. *Basilissa costulata* Watson var. *depressa* Dall; profile, alt. 2.5.
5. *Fluxina discula* Dall; profile, alt. 3.0.
6. *Fluxina discula* Dall; base, 6.5.
7. *Calliostoma* (*Dentistyla*) *asperrimum* var. *dentiferum* Dall; base, 6.0.
8. *Calliostoma* (*Dentistyla*) *asperrimum* var. *dentiferum* Dall; profile, showing tooth on the pillar; 7.5.

PLATE XXIV.

FIG. 1. *Calliostoma* (*Dentistyla*) *sericifilum* Dall; 4.2.
1 a. *Calliostoma* (*Dentistyla*) *sericifilum* Dall; base, 4.5.
2. *Callogaza Watsoni* Dall, base of young shell; 6.0.
2 a. *Callogaza Watsoni* Dall; 6.0.
3. *Calliostoma apicinum* Dall; alt. 7.5.
3 a. *Calliostoma apicinum* Dall; base, diam. 7.0.
4. *Calliostoma yucatecanum* Dall; 7.0.
4 a. *Calliostoma yucatecanum* Dall; base, 7.0.
5. *Liotia briareus* Dall; alt. 7.5.
5 a. *Liotia briareus* Dall; base, 9.0.
6. *Calliostoma roseolum* Dall; alt. 9.5.
6 a. *Calliostoma roseolum* Dall; base, 7.0.
7. *Leptothyra Philipiana* Dall; alt. 3.5.
7 a. *Leptothyra Philipiana* Dall; base, diam. 4.0. This species is named in honor of Dr. Philip P. Carpenter.

PLATE XXV.

FIG. 1. *Addisonia* (*lateralis* var. ?) *paradoxa* Dall; from above; 10.0.
1 b. *Addisonia* (*lateralis* var ?) *paradoxa* Dall, profile; alt. 4.0.
1 c. *Addisonia* (*lateralis* var. ?) *paradoxa* Dall; from below, showing soft parts.
1 d. *Addisonia* (*lateralis* var. ?) *paradoxa* Dall; showing animal crawling.
1 e. *Addisonia* (*lateralis* var. ?) *paradoxa* Dall; dentition, complete series across the radula.
2. *Cocculina Beanii* Dall; dentition, transverse series and one detached uncinus.
3. *Pectinodonta arcuata* Dall; dentition, pair of laterals.
3 a. *Pectinodonta arcuata* Dall; base of right lateral, with cusp broken off.
3 b. *Pectinodonta arcuata* Dall; shell in profile, twice natural size.
4. *Cocculina Beanii* Dall; in profile; 8.0.
5. *Cocculina Rathbuni* Dall; dentition, transverse series and two detached uncini.
6. *Lepetella tubicola* Verrill; dentition, transverse series.
7. *Cocculina Rathbuni* Dall, from above; 10.0.
7 a. *Cocculina Rathbuni* Dall, in profile; 10.0.
8. *Cocculina Beanii* Dall, from above; 8.0.

PLATE XXVI.

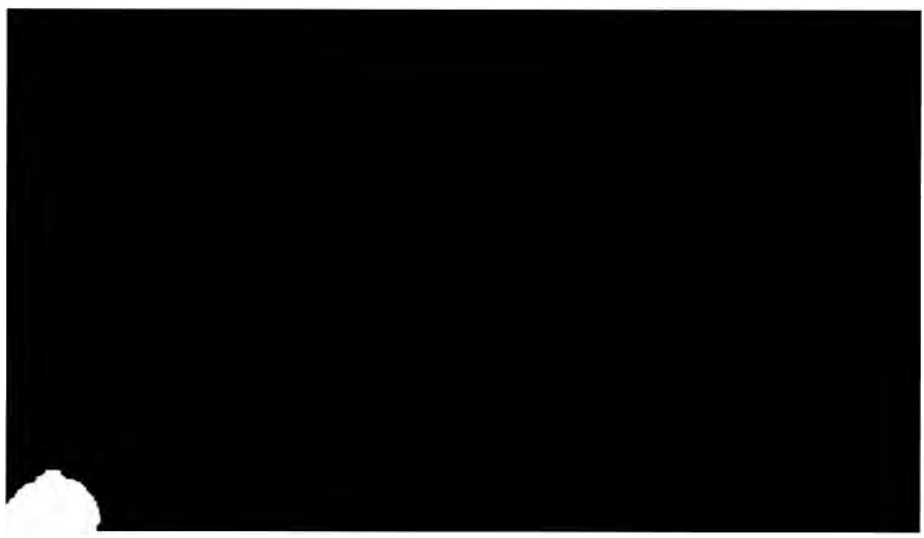


PLATE XXVII.

FIG. 1. *Dentalium laqueatum* Verrill; 29.0.
2. *Dentalium ceratum* Dall, v ry young; 7.0.
3. *Dentalium carduus* D ll; 16.0.
4. *Dentalium Gouldii* Dall, var. *obscurum;* 28.0.
5. *Cadulus quadridentatus* Dall, and outline of aperture; 10.0.
6. *Dentalium perlongum* Dall, and outline of apertu.e; 80.0.
7. *Cadulus amiantus* Dall; 5.75.
8. *Cadulus lunula* Dall, and outline of aperture; 6.0.
9. *Cadulus æqualis* Dall, and outline of aper:ure; 15.0
10. *Dentalium callithrix* Dall; 25.0.
11. *Cadulus acus* Dall; 8.0.
12. *Dentalium ensiculus* Jeffreys, and outline of aperture; 20.0.
12 a. *Cadulus Watsoni* Dall. and outline of aperture; 13.0.
12 b. *Dentalium callipeplum* Dall; 36.0.
12 c. *Cadulus Agassizii* Dall, and outline of aperture; 9 0.
12 d. *Cadulus cucurbita* Dall, and outline of aperture, 4.0.

NOTE.—When the outline of the aperture is given it is on the same scale as the figure to which it refers, and its antero-posterior line is from left to right, or in the direction of a line drawn across the plate horizontally.

PLATE XXVIII.

FIG. 1. *Margarita erythrocoma* Dall; alt. 5.0.
2. *Calliostoma orion* Dall; alt. 4.5.
3. *Ethalia solida* Dall; bas , 2.75.
4. *Rimula frenulata* Dall: from above; 6.25.
5. *Ethalia solida* Dall, profile; 2.0.
6. *Fossarus (Gottoina) compactus* Dall, profile; 2.3.
7. *Ethalia reclusa* Dall, p ofile; alt. 1.0.
8. *Ethalia reclusa* Dall, base; 2.1.
9. *Cyclostrema pompholyx* Dall; 4.2.
10. *Fossarus (Gottoina) bellus* Dall; 3.5.
11. *Liotia miniata* Dall: 2.5.

PLATE XXIX.

FIG. 1. *Pleurotomaria Quoyana* F. & B. The animal sketched from life by J. H. Blake, redrawn by McConnell; 50.0.
2. *Lampusia gracile* Reeve; 25.5.
3. *Aurinia Gouldiana* Dall: 69.0.
4. *Fusus caloosaënsis* Heilprin: 60.0. In arranging the figures for the plates, by an error this figure was substituted for that of *F. timessus*, Dall. The figure of *F. timessus* will therefore appear in my Report on the Fossils of the Florida Pliocene.
5. *Æsopus Stearnsii* Tryon: 4.0.
6. *Terebra (Acus) benthalis* Dall; 21.0.
7. *Dolophanes Gabbii* Dall: 9.00.
8. *Mesostoma migrans* Dall: 9.25.

PLATE XXX.

FIG. 1. *Pleurotomaria Adansoniana* C. & F. Redrawn by McConnell from water-color sketch from life by J. H. Blake. The shell is merely indicated.

2. Anterior termination of gill in *P. Adansoniana*. *a*, osphradium; *b*, blood sinus (?). Only the inner series of gill lamellæ is here indicated. At this part of the gill they are narrow and pointed; farther back they become broader and more rounded at the distal end.

3. Posterior free termination of intestine (*c*) lying on the glandular (renal ?) organ, behind which in the commissure are two orifices on each side (*a*), with a short bunch of papillæ behind them and the flaps of the mantle with their papilose edges (*b*) corresponding to the edges of the sinus on each side.

4. Another specimen.

5. The first specimen crawling.

6. The head, viewed from above.

PLATE XXXI.

FIG. 1. *Pleurotomaria Quoyana* F. & B. Rhachidian and lateral teeth much magnified. 1 b, one of the outermost uncini; 1 c, one of the inner tricuspid uncini greatly magnified.

2. *Propilidium ancyloide* Forbes. Transverse row of teeth from above. 2 b, rhachidian and lateral teeth in profile; 2 c, jaw. All much magnified. Scandinavia and Britain.

3. *Pleurotomaria Adansoniana* C. & F. Separated teeth numbered in their order from the rhachis; *o*, rhachidian tooth.

4. General view of a single transverse row of teeth.

5. Same, a single tufted uncinus; $\frac{1}{1}\frac{2}{0}$.

6. Same, end of tufted uncinus; $\frac{2}{1}\frac{0}{0}$.

7. *Cocculina spinigera* Jeffreys. Penis from above magnified.

8. *Cocculina spinigera* Jeffreys. Head from above, showing tentacles and position of penis at the side of the right tentacle, magnified.

9. Rhachidian tooth of *C. spinigera*.

10. *Scutellina antillarum* Shuttleworth. Showing rhachidian tooth laterals and consolidated uncini of one side of a single transverse row of the radula; $\frac{1}{1}\frac{8}{0}$.

11. The same, a single separated uncinus.

PLATE XXXIII.

FIG. 1. *Calliostoma corbis* Dall; 5.0.
2. *Solarium peracutum* Dall; 17.5.
3. *Orulactæon Meekii* Dall; apex 3.0.
4. *Orulactæon Meekii* Dall; 5.5.
5. *Solarium peracutum* Dall; 17.5.
6. *Cyclostrema turbinum* Dall; 3.25.
7. *Euchelus guttarosæ* Dall; 5.00.
8. *Liotia Bairdii* Dall; 6.0.
9. *Leptothyra Linnei* Dall; 5.5.
10. *Calliostoma* (*Eutrochus*) *Sayanum* Dall; 40.0.
11. *Calliostoma* (*Eutrochus*) *Sayanum* Dall; 37.0.

PLATE XXXIV.

These figures are from drawings by the late Dr. William Stimpson.

FIG. 1. *Olivella mutica* Say. *a–g*, varieties of form and color, natural size; *h*, operculum, natural size; *i*, *l*, operculum outside and inside, magnified; *m*, animal crawling; *n*, head, showing absence of eyes and tentacles; *o*, section of oral aperture magnified; *p*, penis; *r*, section of shell showing absorption of internal walls.
2. *Olivella mutica* Say; dentition.
3. *Purpura hæmastoma* Linné var. *floridana* Conrad. *c*, animal from below, natural size; *d*, head and verge from above.
4. *Purpura hæmastoma* Linné var. *floridana* Conrad; dentition.
5. *Scaphella junonia* Hvass. *b*, shell one-half natural size; *c*, sculpture of early whorls; *d*, nucleus; *e*, section of shell.
6. *Volutomitra grönlandica* Beck. Young shell and magnified nucleus. Cape Cod northward.
7. *Volutomitra grönlandica* Beck. Rhachidian tooth; *a*, from above; *b*, in profile.
8. *Olira literata* Lamarck. *a*, animal crawling, ½; *b*, tentacula and eyes; *c*, soft parts removed from the shell, showing (*f*) foot, (*g*) propodium, (*h*) respiratory siphon, (*i*) vent, (*l*) posterior filament of mantle, (*m*) mantle raised up, (*n*) verge, (*o*) gill; *d*, section of muzzle showing proboscis extruded; *e*, gill and sensory organ (osphradium).
8♀. *Olira literata* Lamarck. Dentition taken from a female specimen.

PLATE XXXV.

FIG. 1. *Mitromorpha biplicata* Dall; 7.0.
2. *Aurinia robusta* Dall; 119.0.
3. *Columbella* (*Astyris*) *profundi* Dall; 8.0.
4. *Cancellaria* (*Trigonostoma*) *Agassizi* Dall; 13.5.
5. *Fusus eurosminus* Dall; 85.0.
6. *Benthobia Tryoni* Dall; 13.0.
7. *Fusus halistreptus* Dall; 80.0.
8. *Marginella cassis* Dall; 15.0.
9. *Columbella* (*Astyris*) *diaphana* Verrill; 9.0.
10. *Conomitra Blakeana* var. *ferrior* Dall; 9.75.
11. *Liomesus? Stimpsoni* Dall; 32.5.
12. *Eudolium Verrillii* Dall; 32.0.
12 a. *Siphonalia* (*Tychosalpinx?*) *globulus* Dall; 31.0.

PLATE XXXVI.

FIG. 1. *Drillia alesidota* var. *macilenta* Dall; 36.5.
2. *Lampusia pharcida* Dall; 23.6.
3. *Drillia* (*Cymatosyrinx*) *Moseri* Dall; 30.0.
4. *Daphnella pompholyx* Dall; 12.5.
5. *Leucosyrinx tenoceras* Dall; 60.0.
6. *Pleurotomella Edgariana* Dall; 58.0.
7. *Mesorhytis Meekiana* Dall; 15.5.
8. *Terebra nassula* Dall; 55.0.
9. *Drillia* (*Cymatosyrinx*) *centimata* Dall; 22.5.
10. *Drillia* (*Cymatosyrinx*) *œpynota* Dall; 15.0.
11. *Cordieria Rouaultii* Dall; 13.6.

PLATE XXXVII.

FIG. 1. *Cancellaria* (*Trigonostoma*) *Smithii* Dall; 10.5.
2. *Calliostoma aurora* Dall; lat. 26.5.
3. *Ringicula nitida* Verrill; 7.5.
4. *Pleurotomaria* (*Entemnotrochus*) *Adansoniana* Crosse and Fischer; major diam. 88.0.
5. *Pleurotomaria* (*Perotrochus*) *Quoyana* Fischer and Bernardi; major diam. 48.0.
6. *Gaza Fischeri* Dall, enlarged three-fifths; diameter of specimen, 25.0.

PLATE XXXVIII.

FIG. 1. *Pleurotoma* (*Leucosyrinx*) *subgrundifera* Dall; 30.0.
2. *Marginella Watsoni* Dall; 9.5.
3. *Pleurotoma* (*Ancistrosyrinx*) *elegans* Dall; 27.0.
4. *Vermetus* (*Petaloconchus*) *erectus* Dall; 25.0.
5. *Typhis* (*Trubatsa*) *longicornis* Dall, adult; 23.0.
6. *Leptothyra induta* Watson var. *albida* Dall; 7.0.
7. *Mitra Swainsoni* Broderip var. *antillensis* Dall; 80.0.

PLATE XXXIX.

PLATE XL.

FIG. 1. *Pecten phrygium* Dall; 36.5.
2. *Cuspidaria microrhina* Dall, dorsal view of right valve, natural size
3. The same, side view.
4. *Cardium* (*Fulvia*?) *peramabilis* Dall; ½.
5. *Callocardia* (*Vesicomya*) *venusta* Dall; 19.0.
6. *Amusium Dalli* E. A. Smith, natural size.
7. *Meiocardia Agassizii* Dall; 22.0.
8. *Tindaria amabilis* Dall; 15.0.

PLATE XLI.

FIG. 1. *Mangilia oxytata* Bush.
2. *Mangilia lanceolata* Adams var. *psila* Bush.
3. *Mangilia melanitica* Dall var. *oxia* Bush.
3 a. *Mangilia melanitica* Dall var.
4. *Mangilia atrostyla* Dall.
4 a. *Mangilia atrostyla* Dall.
5. *Nassarina glypta* Bush.
5 a. *Nassarina glypta* Bush.
6. *Triforis turris-thomæ* Orbigny.
7. *Adeorbis supranitidus* Wood.
7 a. *Adeorbis supranitidus* Wood.
8. *Scala teres* Bush.
9. *Eulimella? engonia* var. *teres* Bush.
10. *Niso interrupta* Sby. var. *aglëes* Bush.
11. *Volvula acuta* Orbigny.
12. *Volvula oxytata* Bush.
13. *Tornatina Candei* Orbigny.
14. *Cylichnella bidentata* Orbigny.
15. *Retusa cælata* Bush.
16. *Philine sagra* Orbigny.
16 a. *Philine sagra* Orbigny.
17. *Actæon punctostriatus* Adams, var.
18. *Dentalium leptum* Bush.
18 a. *Dentalium leptum* Bush.
19. *Cadulus carolinensis* Bush.
20. *Cadulus quadridentatus* var. *incisus* Bush.
21. *Cuspidaria ornatissima* Orbigny.

The drawings for this plate were made by Miss Bush, and lent by Professor Verrill for use in the present publication. They first appeared in the Transactions of the Connecticut Academy of Sciences (vol. vi, part ii, plate xiv).

PLATE XLII.

FIG. 1. *Pteronotus phaneus* Dall; 17.0.
2. *Pseudamusium strigillatum* Dall; 10.0.
3. *Eulepleura Stimpsoni* Dall; 12.0.
4. *Crassatella floridana* Dall; 50.0.
5. *Benthonella gaza* Dall; 10.0.
6. *Marginella cineracea* Dall; 13.0.
7. *Mitra Bairdii* Dall; 35.0.
8. *Scala babylonia* Dall; 30.0.
9. *Pecten effluens* Dall; 26.0.
10. *Peristichia toreta* Dall; 10.75.
11. *Cyclostrema cistronium* Dall; max. diam, 2.0.

The figures on this plate are unpublished and were drawn for mission by J. C. McConnell.

PLATE XLIII.

FIG. 1. *Argonauta argo* Lin. var. *americana* Dall. The animal slightly contracted by alcohol.
1 a. The same, the shell from in front.
1 b. The same, from the side.
2. *Abralia megaptera* Verrill, front view of one of the sessile arms, ½.
3. *Cavolinia* (*Diacria*?) *Hargeri* Verrill. This is referred by Pelseneer to the young of some indeterminate *Cavolinia*, but the large size of the shell and the absence of intermediate specimens would seem to render this decision questionable.
4. *Atlanta Peronii* Lesueur, side view.
4 a. The same, front view.
5. *Heterodoris robusta* V. and E., dorsal view.
5 a. The same, ventral view.
6. *Doris complanata* Verrill and Emerton, dorsal view.
7. *Koonsia obesa* Verrill, somewhat distorted by alcohol; ½.
8. *Cæcum Cooperi* Smith: anterior part of shell showing animal extended, enlarged about 10 diameters.

This plate appeared in the Transactions of the Connecticut Academy of Sciences (vol. vi, pl. xxviii). The figures were drawn for the U. S. Fish Commission by Mr. J. H. Emerton.

PLATE XLIV.

FIG. 1. *Coralliophila Deburghiæ* Reeve var. *Lintoni* Verrill; 27.0.
2. *Eudolium Crosseanum* Monterosato; 60.0.
2 a. The same, part of the odontophore, 2½.
2 b. The same, animal partly contracted by alcohol.
3. *Lunatia levicula* Verrill; 39.0.
4. *Marginella* (*apicina* var.?) *borealis* Verrill 11.0.
5. *Adeorbis*? *olivaceus* Verrill; 4.0.
6. *Capulus hungaricus* Linné; 20.0.
7. *Pleurotomella Packardi* Verrill; soft parts.
8. *Mangilia comatotropis* Dall.
9. *Choristes elegans* Carpenter, young shell, enlarged.
9 a. Top view of a somewhat older specimen same scale.
9 b. Basal view of a still older specimen, same scale.

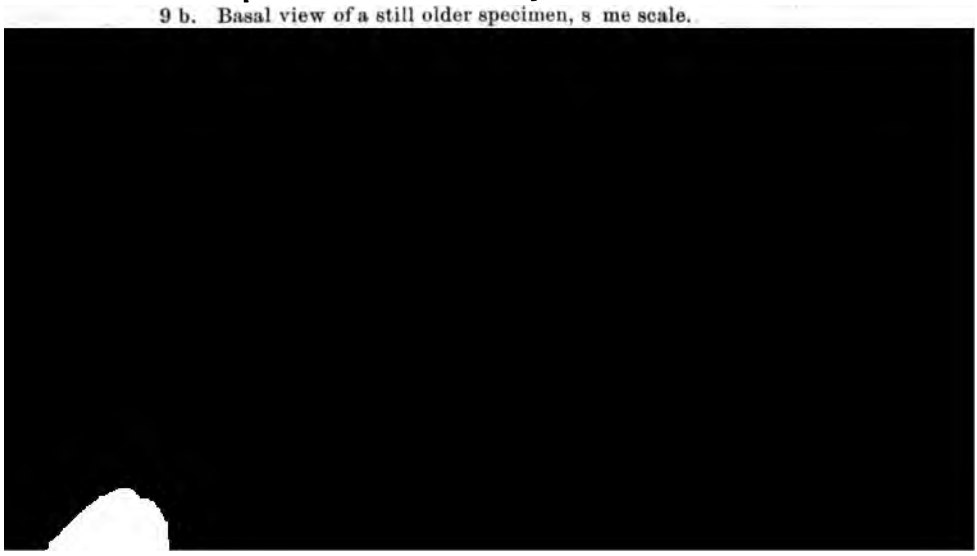


PLATE XLV.

FIG. 1. *Placophora atlantica* Verrill & Smith; nat. size.
1 a. The same, dorsal view.
1 b. The same, views of detached valves, two diameters.
2. *Trachydermon exaratus* Sars; 20.0.
2 a. The same, ventral view.
2 *b*. Anterior valve, ⅓.
3. *Cuspidaria lamellosa* Sars; 7.3.
4. *Lyonsia? arata* Verrill & Smith; 36.0.
5, 6. The same; views of the beak and hinge of two specimens to show variations; ⅓.
7. *Lyonsiella* (*insculpta* Jeffreys var.?) *gemma* Verrill; 4.5. Interior of left valve.
8. The same; exterior of the right valve of a larger specimen.
9. *Verticordia* (*Trigonulina*) *ornata* Orbigny; 3.0.
9 a. The same, view of the interior.
10. *Diplodonta turgida* Verrill & Smith; 25.0.
11. The same, interior of a somewhat smaller valve.
12. *Modiola polita* Verrill & Smith; 33.0.
13. *Tellimya ferruginosa* Montagu; 8.5, with the animal extended.
14. *Leda pernula* Müller; 17.0. Halifax to Martha's Vineyard, on the American coast; Europe.
14 a. The same, view of the hinge.
15. *Leda acuta* Conrad; 12.0. Side view.
16. *Idas argenteus* Jeffreys, var. *lamellosus* Verrill & Smith; ⅓.
16 a. The same, interior of the right valve; ⅓.

This plate first appeared in the Transactions of the Connecticut Academy of Sciences (vol. vi., pl. xxx). The figures were drawn, under the direction of Prof. A. E. Verrill, for the U. S. Fish Commission, by J. H. Emerton.

PLATE XLVI.

FIG. 1. *Purpura hæmastoma* Linné var. *floridana* Conrad, operculum, inside view, nat. size.
1 a. The same, outside view.
2 *a*. The same, a view of the shell, nat. size.
2 *b*. The same, from the opposite side. [The preceding figures were drawn by the late Dr. William Stimpson.]
3. *Pleurotomella chariessa* Watson; 52.0.
4. *Pleurotomella tincta* Verrill; 22.0.
5. *Pleurotomella Frielei* Verrill; 22.0.
6. *Pleurotomella vitrea* Verrill; 8.0.
7. *Pleurotomella Lottæ* Verrill; 11.5.
8. *Pleurotomella* (*Gymnobela*) *Blakeana* Dall; 8.0.
9. *Admete? nodosa* Verrill; 12.0.
10. *Jumala brychia* Verrill; 41.0.
10 a. The same, operculum.
11. *Laxispira nitida* Verrill; 5.0.
12. *Omalaxis nobilis* Verrill; diam. 11.0, alt. 3.0.
13. *Pleurobranchus americanus* Verrill; 13.5.
14. *Coleophysis? eburnea* Verrill; 6.0.
15. *Actæon melampoides* Dall; 8.0.

PLATE XLVI—Continued

FIG. 16. *Dentalium candidum* Jeffreys; 75.0;
17. The same, young shell; 35.0.
18. *Dentalium laqueatum* Verrill; 45.0.
19. *Cadulus spectabilis* Verrill; 22.0.
20. *Cadulus grandis* Verrill; 12.5.
21. *Pseudamusium undatum* Verrill & Smith; 19.0.
22. *Cryptodon grandis* Verrill; 21.0.
23. *Barbatia* (*Macrodon*?) *profundicola* Verrill; 12.0.
23. The same, interior of left valve.
24. *Discinisca atlantica* King; 6.2; view from above, the setæ projecting from the shell.

With the exceptions mentioned, the figures above enumerated first appeared in the Transactions of the Connecticut Academy of Sciences (vol. vi, pl. xliv). They were drawn under the supervision of Prof. A. E. Verrill, for the U. S. Fish Commission, by Messrs. J. H. Blake and J. H. Emerton.

PLATE XLVII.

FIG. 1. *Melampus flavus* Gmelin; 12.0.
2. *Melampus floridanus* Shuttleworth; 7.5.
3. *Melampus coffeus* Linné, nat. size.
4. *Pedipes elongatus* Dall; 4.0.
5. *Tralia pusilla* Gmelin; 11.0.
6. *Pedipes unisulcatus* Cooper, west coast of America. Introduced for comparison.
7. *Detracia bulloides* Montagu; 11.0.
8. *Auriculastrum pellucens* Menke; 16.0. In old specimens the peristome becomes rather thick.
9. *Melampus lineatus* Say; nat. size.
10. *Sayella Crosseana* Dall; 2.5.
11. *Sayella Hemphillii* Dall; 3.75.
12. *Melampus lineatus* Say, typical or banded form, nat. size.
13. *Leuconia bidentata* Montagu.
14. *Blauneria heteroclita* Montagu.

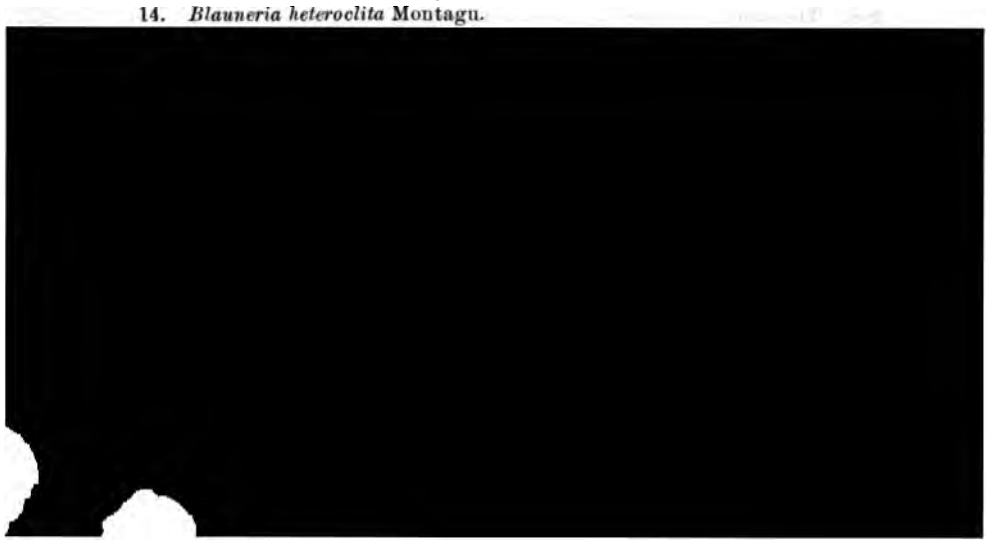


PLATE XLVIII.

FIG. 1. *Drillia thea* Dall; 15.0.
2. *Oscilla nivea* Mörch; 8.5.
3. *Mangilia limonitella* Dall; 6.75.
4. *Turbonilla* (*Parthenia*) *cedrosa* Dall; 5.5. The aperture is a little broken.
5. *Mitra floridana* Dall; 6.0.
6. *Phos parvus* Ads. var. *intricatus* Dall; 13.2.
7. *Drillia leucocyma* Dall; 7.5. The last whorl of this specimen has been repaired after fracture.
8. Teeth of *Capulus hungaricus* Linné, much enlarged.
9. *Sipho pygmæus* Gould, showing soft parts.
10. *Tachyrhynchus erosa* Couthouy?, showing animal and part of the shell, enlarged. Cape Cod northward, West America, Arctic Seas.
11. *Liostraca Hemphillii* Dall; 3.0.
12. *Crepidula* (*Janacus*) *unguiformis* Lamarck, dentition much enlarged.
13. *Nassa trivittata* Say, twice nat. size, showing animal as if crawling.
14. *Limacina helicina* Phipps; dentition, enlarged.
15. *Scissurella crispata* Fleming, showing animal, from a sketch by Lucas Barrett; 4.0.
16. *Crepidula fornicata* Lamarck, from below, showing soft parts; 20.0.

Figures 1–7 and 11 were drawn by J. C. McConnell and first appeared in the Proceedings of the U. S. National Museum. Figures 9, 10, 13, and 16 were loaned by the U. S. Fish Commission and are now first published. They were drawn by Prof. A. E. Verrill. Figures 8, 12, 14, and 15 have appeared in the publications of the British Museum and Woodward's Manual, and were loaned by the Smithsonian Institution.

PLATE XLIX.

FIG. 1. *Terebratulina caputserpentis* Linné, showing interior of hæmal valve somewhat enlarged. *T. septentrionalis* Couthouy (see plate lxix) appears to be an American race of this species.
2. The same, showing soft parts.
3. *Platidia seminula* Philippi (*P. anomioides* Scacchi); interior of hæmal valve, much enlarged.
4. The same, showing soft parts; 4.5.
5. *Yoldia limatula* Say, showing animal; †.
6. *Parastarte triquetra* Conrad; 5.0. Exterior.
7. The same, interior of right valve.
8. The same, interior of left valve.
9. *Mya arenaria* Linné with the left valve, and mantle-lobe and part of the siphons removed, showing anatomical features: *a*, anterior adductor muscle; *a'* posterior adductor; *b*, visceral mass or body: *cl*, cloaca; *e*, epidermis of siphons; *f*, foot; *g*, gills; *h*, heart; *m*, cut edge of the mantle; *o*, mouth; *s*, *s'*, siphons; *t*, labial palpi; *r*, vent; *u*, the umbo of the shell; *p. o.*, pedal orifice of the mantle; *r*, rectum. From a drawing by Miss Hume.
10. *Lyonsia hyalina* Conrad, showing animal extended.
11. *Thecidium mediterraneum* Sowerby; 5.5; interior of hæmal valve showing soft parts.

Figure 10 is loaned by the U. S. Fish Commission. Figures 6, 7, and 8 are taken from the Proceedings of the U. S. National Museum. The others are from the British Museum series, and were loaned by the Smithsonian Institution.

PLATE L.

FIG. 1. *Purpura lapillus* Linné.
2. The same; a younger specimen.
3. The same; ovicapsules enlarged about four times.
4. *Chrysodomus* (*Sipho*) *pygmæus* Gould.
5. *Scala multistriata* Say.
6. *Urosalpinx cinereus* Say.
7. *Nassa trivittata* Say.
8. *Nassa vibex* Say.
9. *Nassa* (*Ilyanassa*) *obsoleta* Say.
10. *Scala Sayana* Dall; 17.0.
11. *Eupleura caudata* Say, small northern form.
12. *Anachis avara* Say, variety.
13. *Astyris pura*? Verrill; (*A. zonalis* Linsley, non Verrill).
14. *Mangilia*? *plicosa* C. B. Adams.
15. *Mangilia*? *bicarinata* Couthouy.
16. *Astyris lunata* Say.
17. *Bela harpularia* Couthouy.
18. *Lunatia triseriata* Say; young.
19. The same; older specimen.
20. *Lunatia immaculata* Totten.
21. *Natica pusilla* Say.
22. *Cœcum pulchellum* Stimpson.
23. *Crepidula fornicata* Lamarck.
24. The same; young specimen.
25. *Crepidula convexa* Say.
26. *Crepidula* (*unguiformis* Lam. var.?) *plana* Say.
27. *Crucibulum striatum* Say; profile.
28. The same, from below.

Except where otherwise indicated the figures are of natural size. These figures were drawn by E. S. Morse, were first published in Mr. W. G. Binney's edition of Gould's Invertebrata of Massachusetts, and were loaned on the present occasion by the U. S. Fish Commission.

PLATE LI.

PLATE LII.

FIG. 1. *Eumeta subulata* Montagu; (*Cerithiopsis Emersonii* Ad.).
2. *Cerithiopsis Greenii* C. B. Adams.
3. *Triforis adversa* var. *nigrocincta* Adams.
4. *Bittium alternatum* Say; (*B. nigrum* Totten).
5. *Scila terebralis* C. B. Adams.
6. *Turbonilla elegans* Verrill.
7. *Odostomia bisuturalis* Say.
8. *Odostomia trifida* Totten.
9. *Alexia myosotis* Draparnaud, young shell.
10. *Odostomia seminuda.*
11. *Odostomia impressa* Say.
12. *Rissoa* (*Onoba*) *aculeus* Gould.
13. *Syrnola producta* Adams.
14. *Eulima intermedia* Cantraine (*E. oleacea* K. and S.).
15. *Syrnola fusca* Adams.
16. *Solariella obscura* Couthouy.
17. *Rissoa* (*Cingula*) *minuta* Totten.
18. *Skenea planorbis* Fabricius.
19. *Lacuna vincta* Montagu.
20. *Haminea solitaria* Say.
21. *Cylichna alba* Brown.
22. *Actæon puncto striatus* Adams.
23. *Cylichnella oryza* Stimpson.
24. *Diaphana debilis* Gould.
25, 26. *Utriculus pertenuis* Mighels, a series showing variations.
27. *Tornatina canaliculata* Say; 5.0.

Figures 6, 25, and 26 were loaned by the U. S. Fish Commission; and were drawn by Prof. A. E. Verrill. See remarks under Plate L.

PLATE LIII.

FIG. 1. *Anomia simplex* Orbigny, side view.
2. The same, from below.
3. *Siliqua costata* Say.
4. *Ensis americana* Gould.
5. *Anomia aculeata* Gmelin, from above.
6. The same, from below.
7. The same, sculpture magnified.
8. The same, smooth variety.
9. *Modiolaria corrugata* Stimpson.
10. *Crenella glandula* Totten.
11. *Pecten irradians* Lamarck, typical form.

For remarks see note to Plate L.

PLATE LIV.

FIG. 1. *Modiola plicatula* Lamarck, typical form.
2. *Modiolaria nigra* Gray.
3. *Mytilus edulis* Linné, rayed color-variety.
4. *Modiola modiolus* Linné.

For remarks see note to Plate L.

PLATE LV.

FIG. 1. *Tellina tenera* Say, showing extended animal.
2. *Mya arenaria* Linné, showing extended animal.
3. *Tagelus gibbus* Spengler, showing extended animal.
4. *Ensis americanus* Gould, showing extended animal.
5. The same, terminal siphonal papillæ.
6. *Teredo navalis* Linné, removed from burrow, showing external soft parts, shell, and pallets.
7. *Venus mercenaria* Linné, showing extended animal.

These figures were loaned by the U. S. Fish Commission. They first appeared in the first Annual Report of the Commission in Prof. A. E. Verrill's report on the invertebrate animals of Vineyard Sound, and were drawn from life by Professor Verrill.

PLATE LVI.

FIG. 1. *Yoldia limatula* Say.
2. *Arca transversa* Say.
3. *Tagelus gibbus* Spengler.
4. *Nucula proxima* Say.
5. *Tagelus divisus* Spengler.
6. *Macoma baltica* Linné, var. *fusca* Adams.
7. *Kellia planulata* Stimpson, enlarged about twice nat. size.
8. *Nucula delphinodonta* Mighels, enlarged to about twice nat. size.
9. *Yoldia sapotilla* Gould.
10. *Macoma tenta* Say, typical form.
11. *Gemma purpurea* H. C. Lea (*G. gemma* Totten), identified from Lea's type.
12. *Tellina tenella* Verrill.
13. *Tellina tenera* Say.
14. *Cumingia tellinoides* Conrad.
15. *Cytherea convexa* Say.
16. *Arca* (*Argina*) *pexata* Say.

For remarks see note under Plate L. Fig. 12 was drawn by Prof. A. E. Verrill.

PLATE LVII.

FIG. 1. *Cyprina islandica* Linné.
2. *Mactra solidissima* Dillwyn.

For remarks see note under Plate L.

PLATE LIX.

FIG. 1. *Xylotrya fimbriata* Jeffreys; showing shell, interior and exterior, pallets, and sculpture, enlarged.
2. *Teredo navalis* Linné; exterior of shell, pallets, and sculpture, enlarged.
3. *Teredo megotara* Hanley; shell, interior and exterior, and pallets, enlarged.
4. *Teredo Thomsoni* Tryon; shell, interior and exterior, and pallets, enlarged.
5. *Thracia myopsis* Beck; Arctic Seas to Cape Cod.
6. *Periploma* (*Cochlodesma*) *Leana* Couthouy.
7. *Periploma fragilis* Totten.
8. *Gastranella tumida* Verrill, enlarged.
9. *Thracia truncata* Mighels and Adams; Arctic Seas to New York.
10. *Corbula contracta* Say.
11. *Lyonsia hyalina* Conrad.
12. *Pholas* (*Barnea*) *truncata* Say.
13. *Saxicava arctica* Deshayes.
14. *Clidiophora Gouldiana* Dall (*C. trilineata* Gould non Say).
15. *Petricola pholadiformis* Lamarck.

For remarks see note under Plate L. Figure 8 was drawn by Prof. A. E. Verrill.

PLATE LX.

FIG. 66. *Drillia*? *Dalli* Verrill & Smith.
66 a. The same; side view of last whorl, showing anal notch.
67. *Pleurotomella Agassizii* Verrill; adult.
68. *Pleurotomella Bairdii* Verrill.
69. *Pleurotomella Pandionis* Verrill.
70. *Pleurotomella Packardi* Verrill; var. *Benedicti* Verrill & Smith.
70 a. The same; nucleus, showing sculpture of larval or *Sinusigera* shell.
71. *Pleurotomella Agassizii* Verrill; young.
71 a. The same; nucleus, showing *Sinusigera* sculpture.
72. *Pleurotomella Packardi* Verrill; var. *formosa* Jeffreys.
73. *Mangilia bandella* Dall.
74. *Pleurotomella Emertonii* Verrill & Smith.

The figures on this plate and several which follow were loaned by the U. S. Fish Commission. They first appeared in the Report of the Commissioner of Fisheries for 1883, though reduced copies of them had been used to illustrate Prof. Verrill's papers in the Transactions of the Connecticut Academy of Sciences. They were drawn under the supervision of Prof. Verrill for the U. S. Fish Commission by J. H. Emerton and others.

Some of these figures, in a reduced form, reappear on Plates XLIII–XLVI, but as they are rather small there it was thought best to duplicate them by using the larger figures, since the latter were available. Had *all* the figures on the reduced scale been available, separately, of larger size, none of the former would have been used; but, after all, the duplication is of little consequence, as, in a general way, it is true that the more good figures there are accessible, the better for students.

PLATE LXI.

FIG. 75. *Pleurotomella Bruneri* Verrill & Smith.
76. *Pleurotomella catherinæ* Verrill & Smith.
76 a. The same, enlarged tip, showing sculpture of nucleus.
77. *Mangilia comatotropis* Dall.
78. *Bela Tanneri* Verrill & Smith.
79. *Marginella* (*apicina* var. ?) *borealis* Verrill.
80. *Buccinum abyssorum* Verrill, and operculum.
81. *Sipho Sarsii* Jeffreys.
82. *Sipho* (?) *glyptus* Verrill.
86. *Rissoa Jan-Mayeni* Friele.
90. *Scala groulandica* Perry.
91. *Scala Dalliana* Verrill & Smith.
92. *Scala Pourtalesii* Verrill & Smith.
93. *Scala* (*Opalia*) *Leeana* Verrill.
94. *Scala Andrewsii* Verrill; 5.5, Newport, R. Id., 100 fms.

For remarks on these figures see note under preceding plate.

PLATE LXII.

FIG. 83. *Eudolium Crosseanum* Monterosato.
83 a. The same, showing soft parts of male specimen reduced one-third f
ural size.
84. *Oöcorys sulcata* Fischer; shell.
84 a. The same; operculum.
84 b. The same; dentition.
85. *Torellia fimbriata* Verrill & Smith; Martha's Vineyard and north
87. *Fossarus elegans* Verrill & Smith.
88. *Seguenzia monocingulata* Seguenza.
88 a. The same, operculum, inside view.
89. The same, var. *eritima* Verrill.

For remarks on these figures see note under Plate LX.

PLATE LXIV.

FIG. 106. *Scaphander nobilis* Verrill.
123. *Dentalium occidentale* Stimpson; ♀.
124. The same, a more curved variety.
125. The same, a more finely grooved variety.
125 a. The same, transverse section of Fig. 125.
126. *Cadulus Pandionis* Verrill & Smith.
136. *Diplodonta turgida* Verrill & Smith; interior of left valve.
136 a. *Crenella decussata* Montagu.
140. *Leda acuta* Conrad; interior of left valve.
140 a. *Petricola pholadiformis* Lamarck; showing extended siphons.
141. *Pecten* (*Pseudamusium*?) *vitreus* Gmelin.
142. *Pseudamusium imbrifer* Lovèn; *a*, right and *b*, left valve.
142 a. *Turtonia minuta* Fabricius, with extended foot, greatly magnified; drawn by Prof. A. E. Verrill.
142 b. *Argonauta argo* Linné; typical Mediterranean form swimming; for comparison with the variety *Americana*.

Figure 136 *a* first appeared in the proceedings of the U. S. National Museum, illustrating Miss Bush's paper on the shells of Labrador. Figure 142 *b* is from the British Museum series, and was lent by the Smithsonian Institution. The others were received from the U. S. Fish Commission. See note under Plate LX. Figure 140 *a* is one of those drawn by Morse for Binney's Gould. Fig. 142 *a* is now first published.

PLATE LXV.

FIG. 127. *Teredo megotara* Hanley; removed from its burrow, showing shell, pallets and soft parts, about half natural size.
128. *Poromya sublevis* Verrill; interior of right valve.
128 a. *Siliqua costata* Say; interior, showing hinge, pallial line, and muscular impressions.
129. *Cuspidaria striata* Jeffreys.
130. *Cetoconcha bulla* Dall.
131. *Verticordia* (*Trigonulina*) *ornata* Orbigny, right valve; *a*, interior, *b*, exterior view.
132. *Verticordia flexuosa* Verrill & Smith, exterior of left valve.
133. *Lyonsia*? *arata* Verrill & Smith, showing hinge in right valve of two specimens, *a* and *b*.
134. The same, exterior of right valve.
135. *Diplodonta turgida* Verrill & Smith, interior of right valve.

Figure 128 a is now first published. For the others see note under Plate LX.

PLATE LXVI.

FIG. 110. *Atlanta Peronii* Lesueur, side view of shell.
110 a. The same, front view.
111. *Atlanta Gaudichaudi* Eydoux & Souleyet, from a camera lucida sketch by Mr. W. E. Safford.
112. *Creseis conica* Eschscholtz, showing animal in situ.
113. *Cavolinia tridentata* Forskäl, with animal extended.
115. *Cavolinia* (*Diacria*) *trispinosa* Gray, with animal extended.
116. *Cavolinia uncinata* Rang, with animal extended.
117. *Cuvierina columnella* Rang, showing extended animal and remnant of the larval cone at the base.
118. *Creseis recta* Blainville, side view of shell, gre-

PLATE LXVI—Continued.

FIG. 119. *Cresseis* (*Hyalocylix*) *striata* Rang, showing animal extended, enlarged.

120. *Corolla calceola* Verrill, with extended animal in situ, two thirds natural size. This species and *C. spectabilis* Dall, of the Pacific, belong to the same group. The former was referred to *Gleba*, Forskäl, by Dr. Pelseneer in his description of the Challenger Pteropods, probably on account of the poor state of his material. But *C. spectabilis* has precisely such a "shell" as *C. calceola*, which does not resemble the "shell" of *Gleba*, and has been taken with its "shell" in the Santa Barbara Channel, California. The genus *Cymbuliopsis* Pelseneer, being of later date than *Corolla*, will therefore fall into the synonymy of the latter name.

121. *Spongiobranchia australis* Orbigny. This figure represents the adult form of a tropical Pteropod not yet found on our coast, though certain larvæ, perhaps of *Notobranchæa*, have been referred to it.

122. *Clione limacina* Phipps.

Figures 112 and 113 are from Binney's Gould. The remarks applying to the others will be found under Plate LX.

PLATE LXVII.

FIG. 63. *Argonauta argo* Linné, var. *americana* Dall. Animal removed from the shell and somewhat contracted by immersion in alcohol.

63 a. The same, front view of shell.

63 b. The same, side view of shell.

The average *Argonauta argo* of the Mediterranean has from two to three times as many radial folds and carinal nodules as the variety here figured. It is also more compressed and narrow, and the marginal rib on each side of the aperture is less prominent and usually is merged in the margin imperceptibly and does not stand out laterally at all. There are, doubtless, variations in these characters, but on the whole the Antillean and American form seems sufficiently constant for the latter to receive a varietal name.

For remarks on the figures, see note under Plate LX.

PLATE LXVIII.

FIG. 1. *Teredo dilatata* Stimpson, interior and exterior views of valves; pallet-

PLATE LXIX.

FIG. 1. *Astyris rosacea* Gould.
2. *Mya arenaria* Linné.
3. *Litorina rudis*, var. *tenebrosa*, Montagu.
4, 5. *Terebratulina septentrionalis* Couthouy; hæmal view and side view.
6. *Litorina irrorata* Say.
7. *Petricola pholadiformis* Lamarck.
8. *Mactra lateralis* Say.
9. *Thracia Conradi* Couthouy.

PLATE LXX.

FIG. 1. *Mactra ovalis* Gould.
2. *Pecten magellanicus* Gmelin.

PLATE LXXI.

FIG. 1. *Venus mercenaria*, var. *notata*, Say.
2. *Mytilus edulis* Linné; typical form.
3. *Venus mercenaria* Linné; typical.

PLATE LXXII.

FIG. 1. *Chione limacina* Phipps; enlarged to twice natural size.
2. *Philine sinuata* Stimpson.
3. *Philine quadrata* Searles Wood; Europe, Arctic seas, southward to Cape Cod.
4. *Scaphander punctostriatus* Mighels and Adams; enlarged about one-third.
5. *Lamellaria pellucida* Verrill.
6. *Utriculus pertenuis* Mighels.
7. *Utriculus Gouldii* Couthouy.
8. *Philine lineolata* Couthouy; enlarged three times. Arctic seas, southward to Cape Cod.
9. *Adeorbis costulata* Möller.
10. *Scala grænlandica* Perry.
11. *Sipho Stimpsoni* Mörch.
12. *Buccinum undatum* Linné.

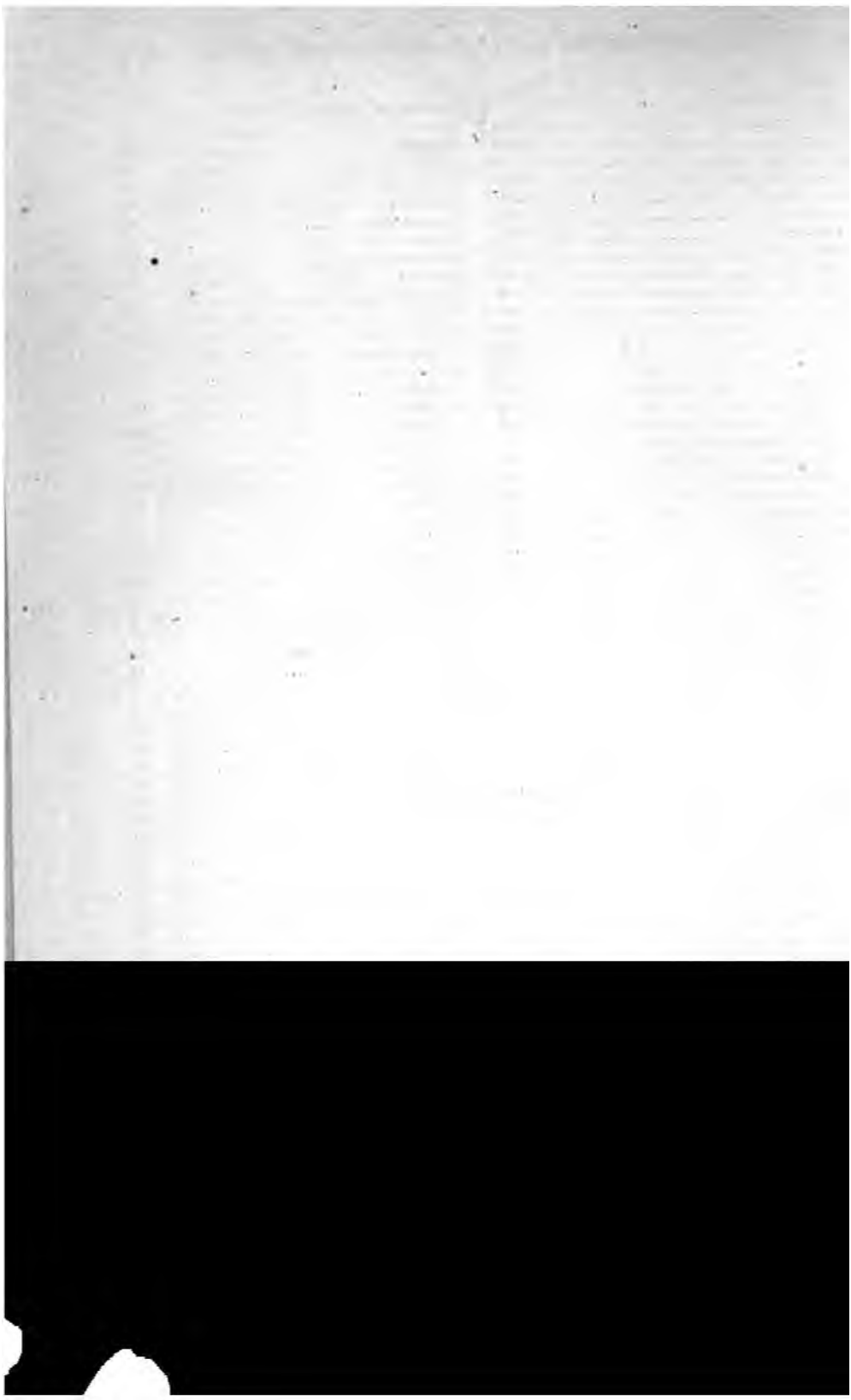
PLATE LXXIII.

FIG. 1. *Fulgur canaliculatus* Linné.

PLATE LXXIV.

FIG. 1. *Fulgur carica* Gmelin.

INDEX TO THE NAMES CONTAINED IN THE TABLES.



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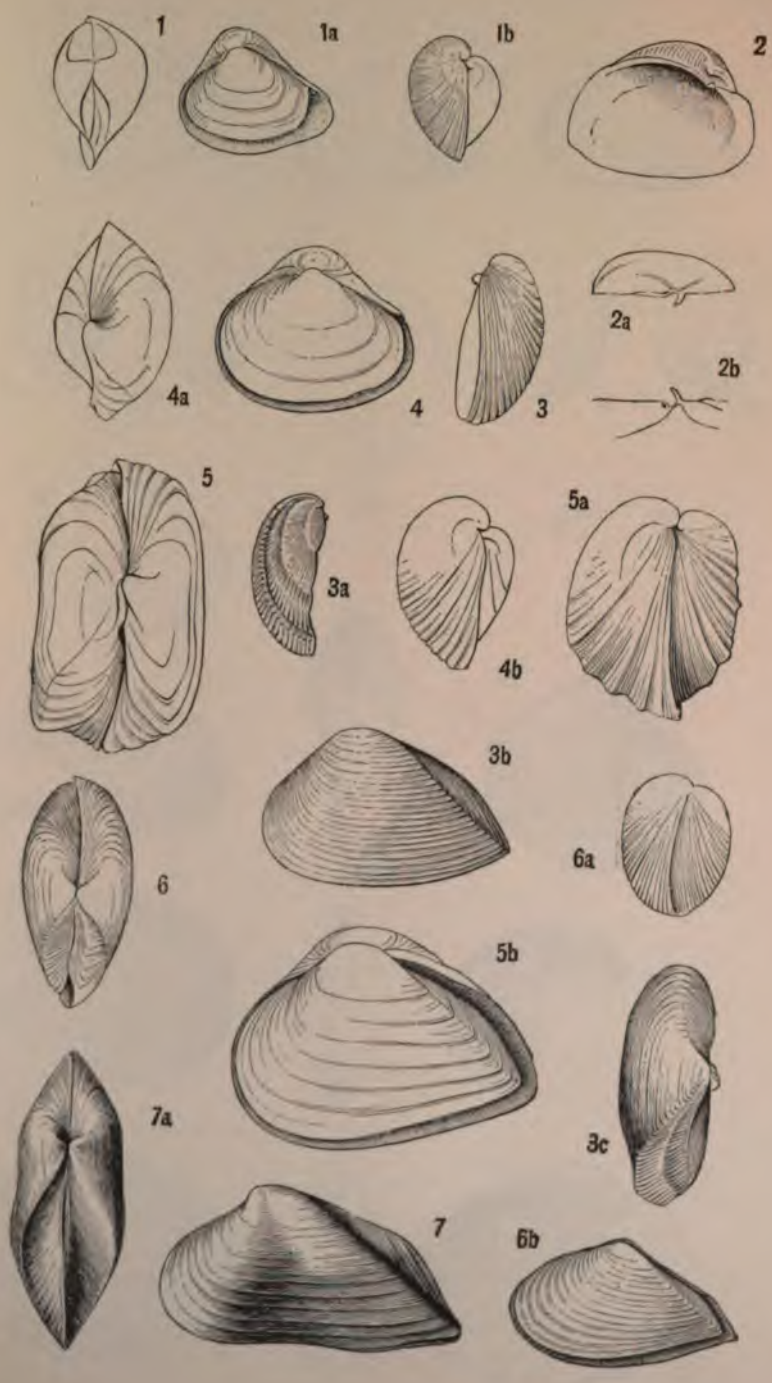

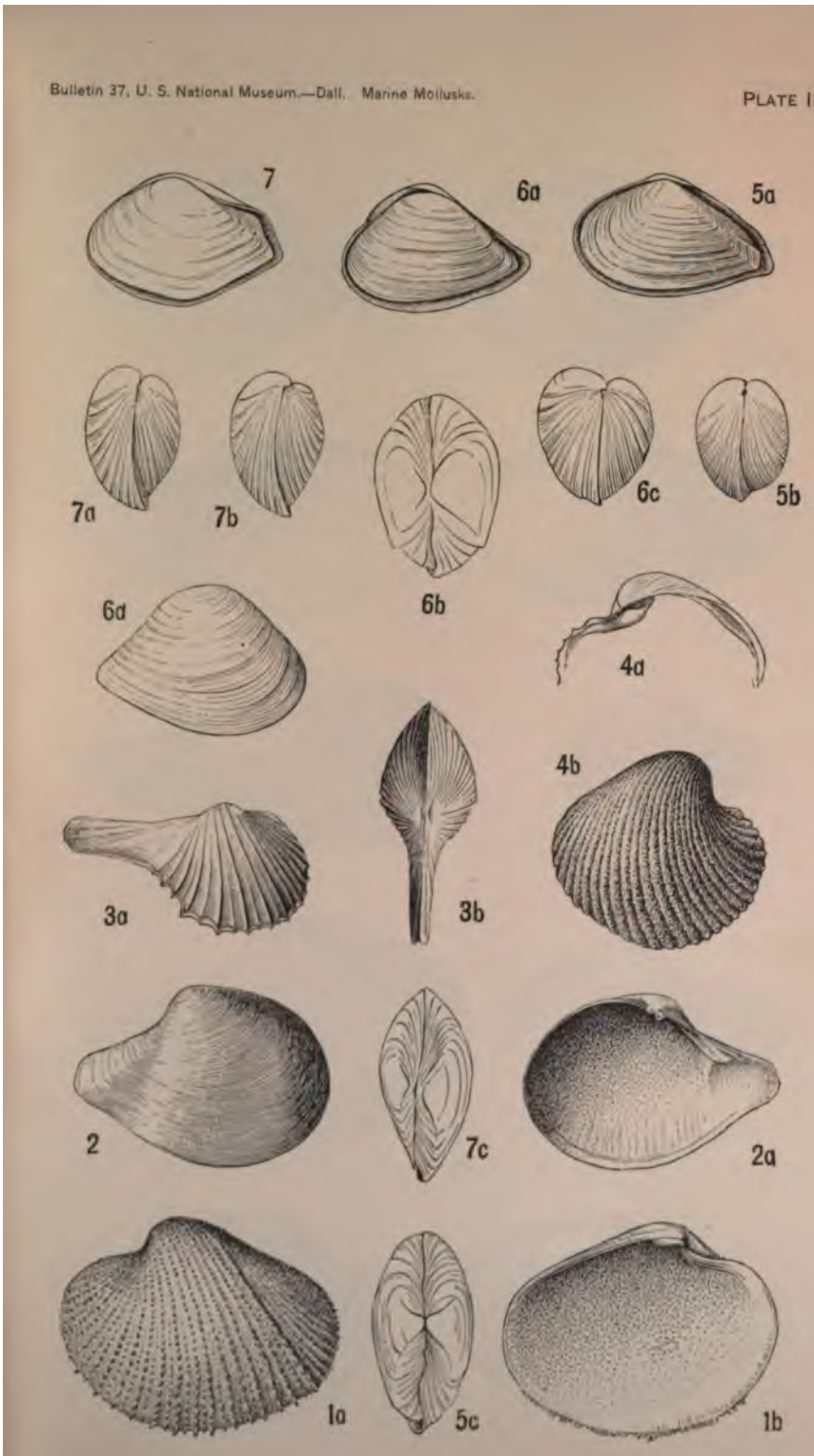
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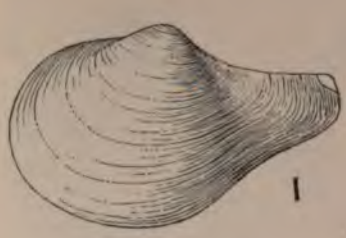
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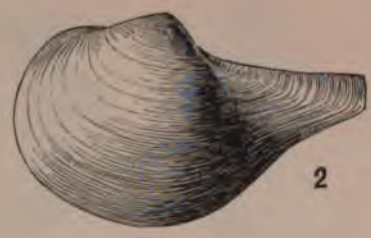
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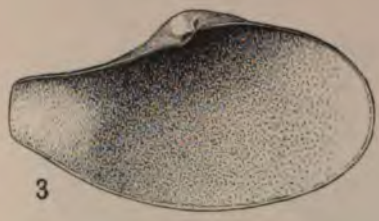
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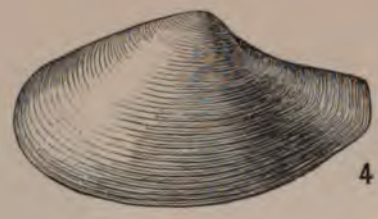
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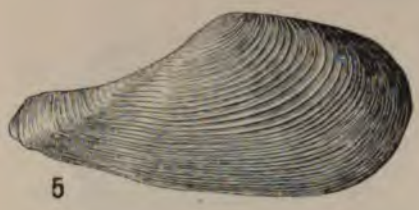
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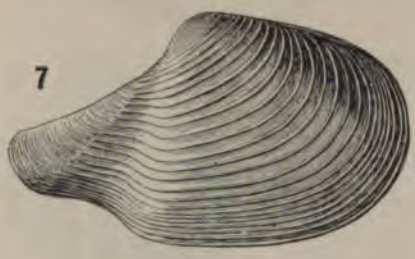
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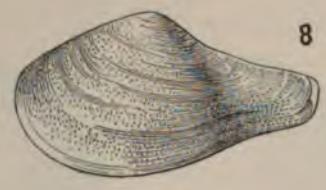
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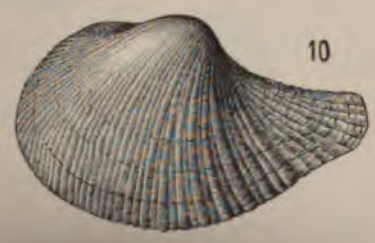
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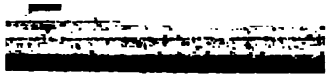

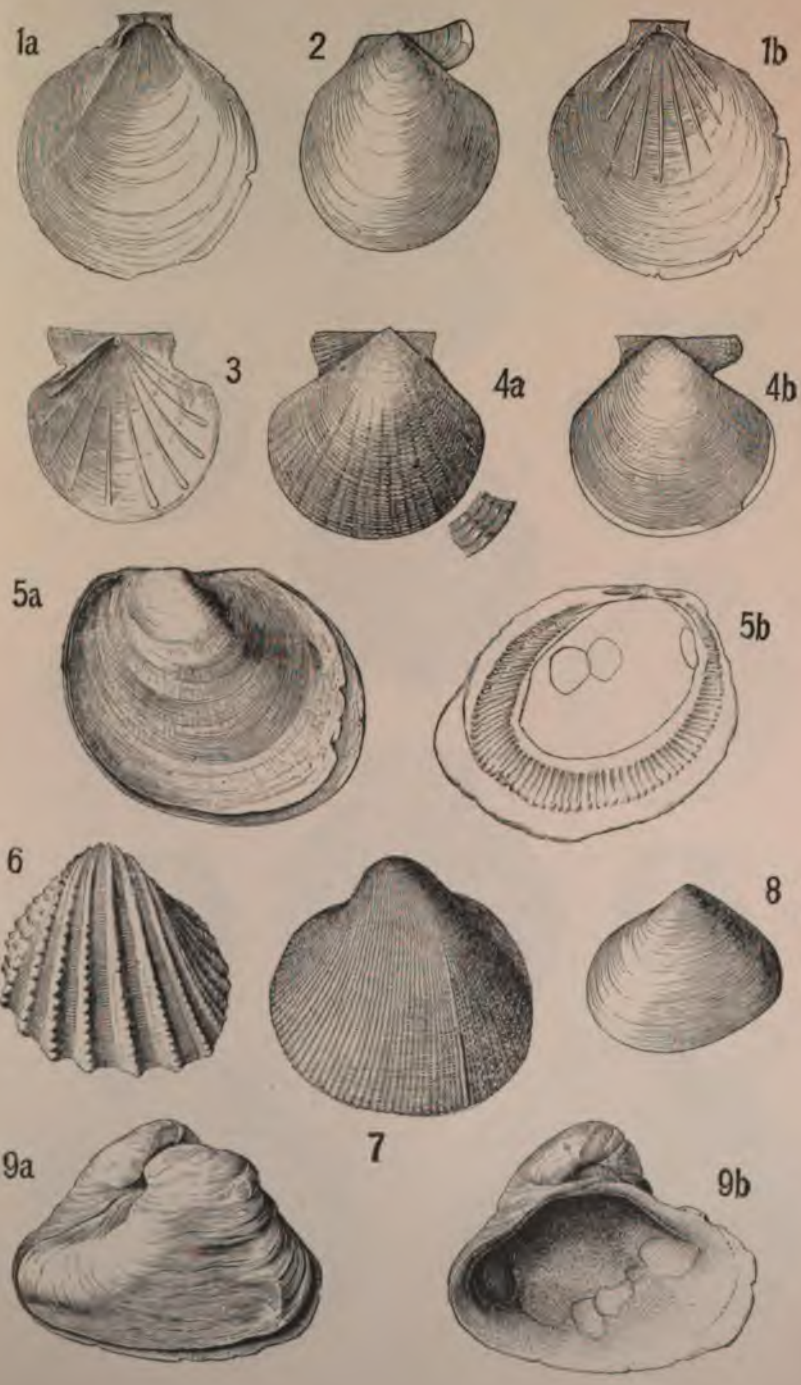
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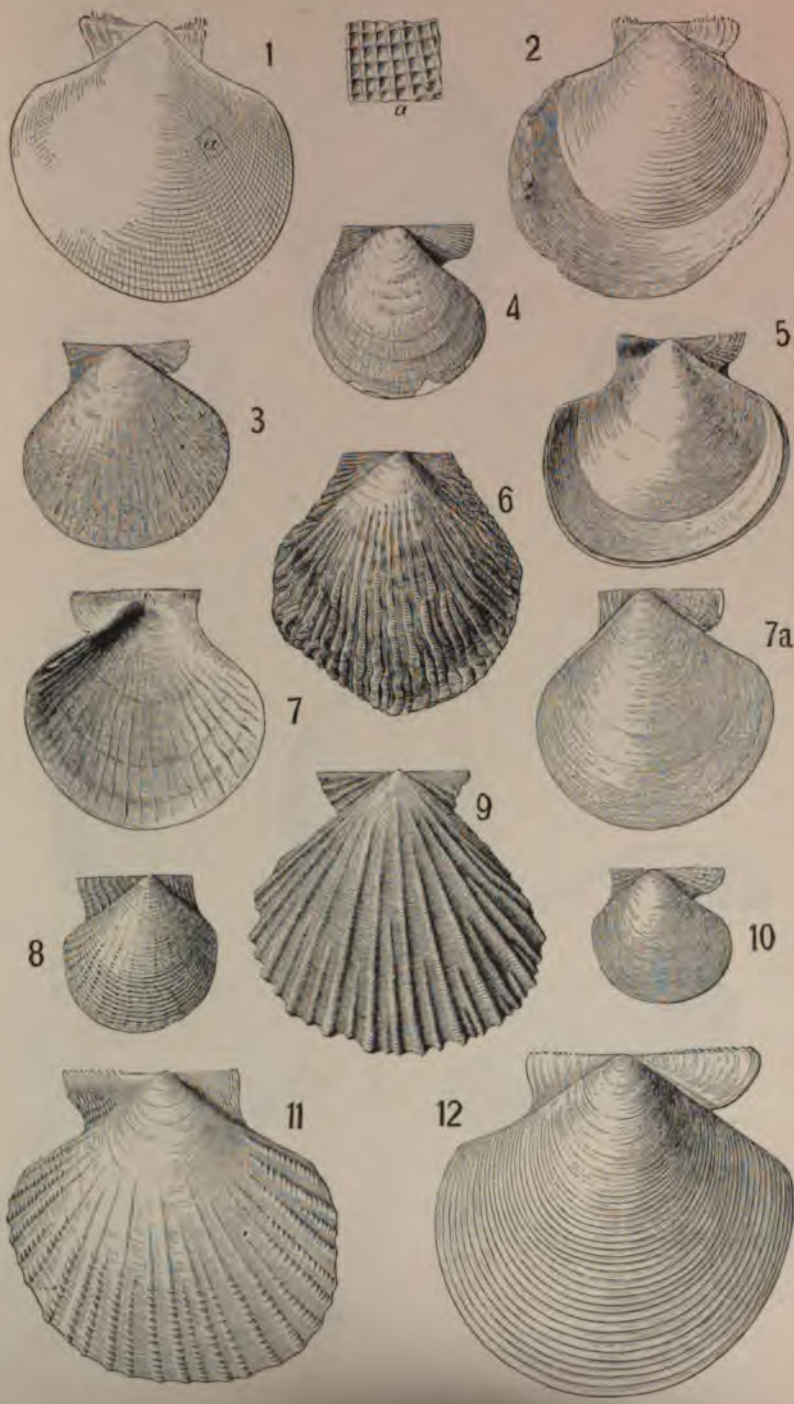
9a
9b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7a
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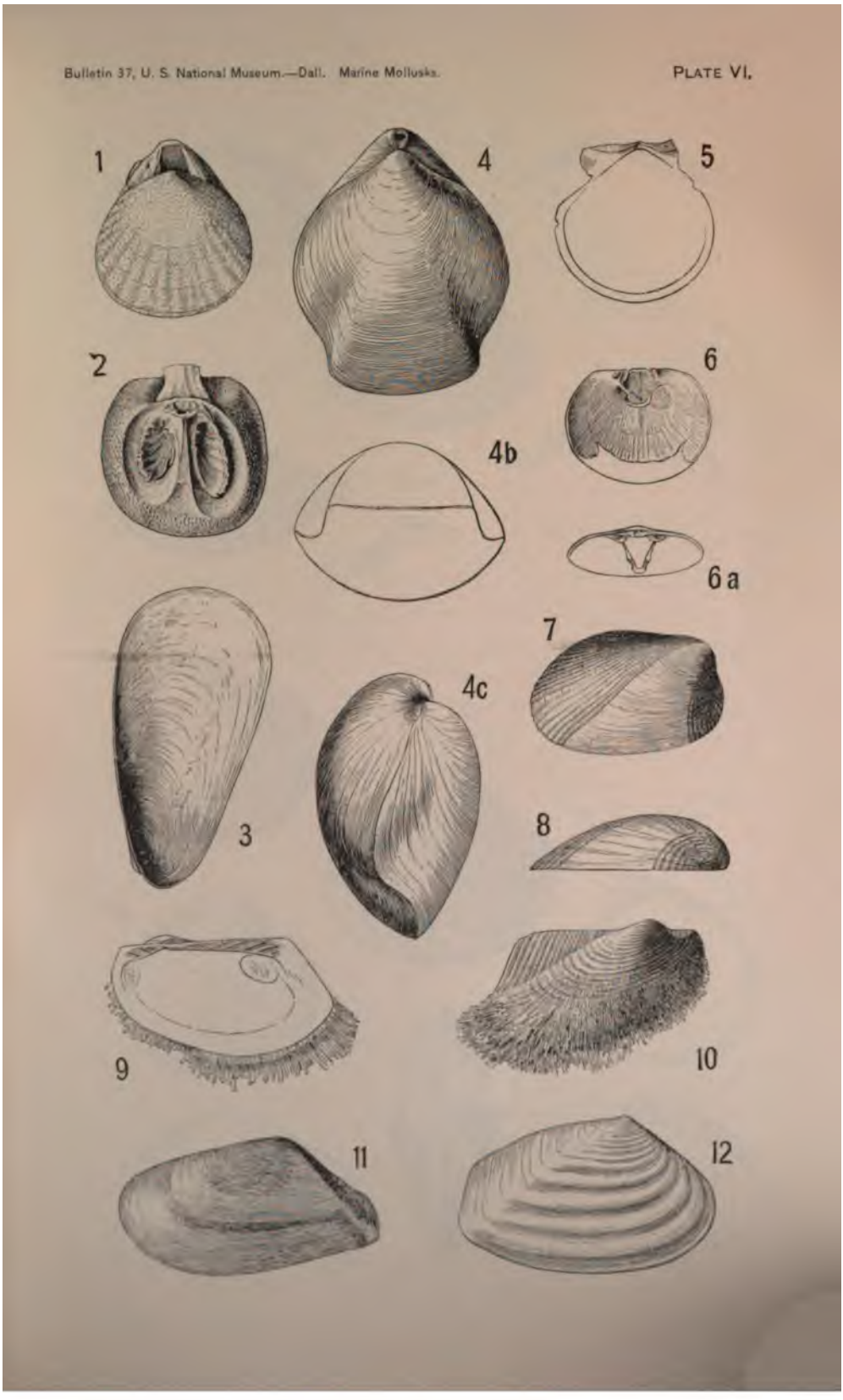
12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4b
6a
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4c
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8
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11
12


1a
1b
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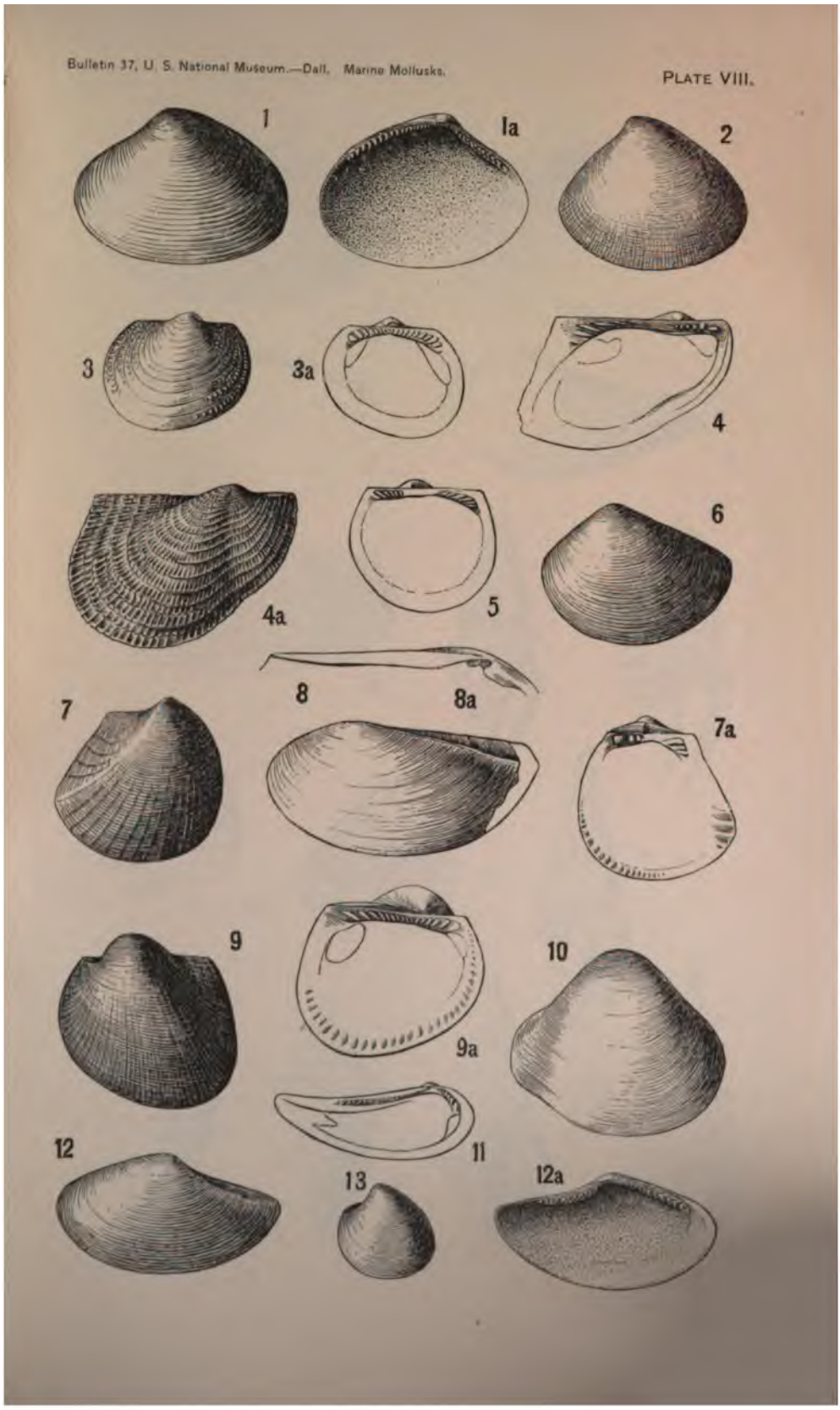
3a
3b
4a
5a
5b
4b
6a
6
8
7a
7b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1a
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8a
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7a
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9a
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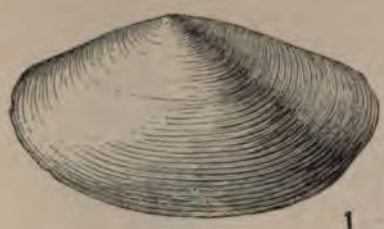
12a



1

1a

2

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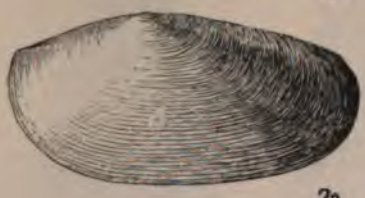

2a

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7a

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8a

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PLATE X.

McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven Conn.

PLATE XI

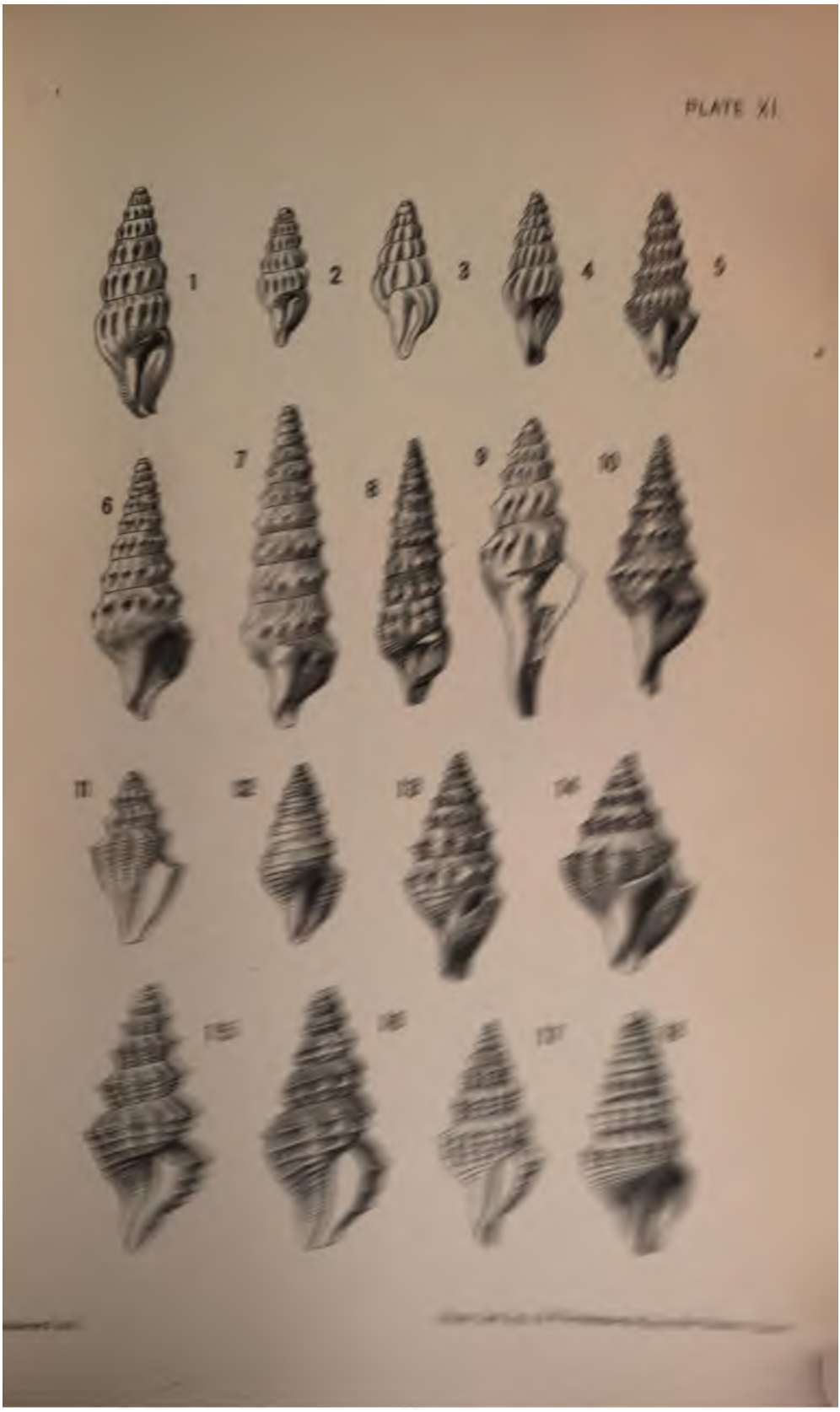


PLATE XII.

McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

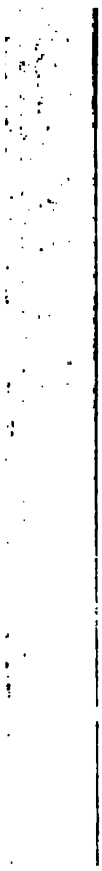
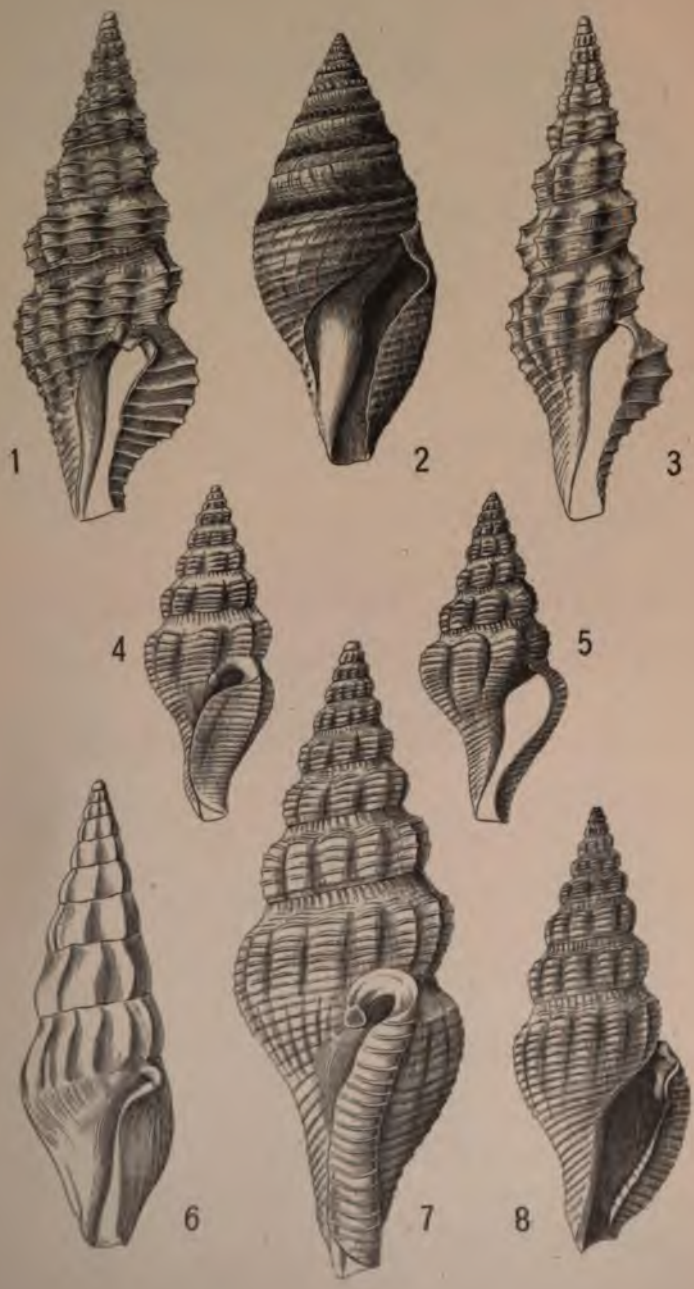


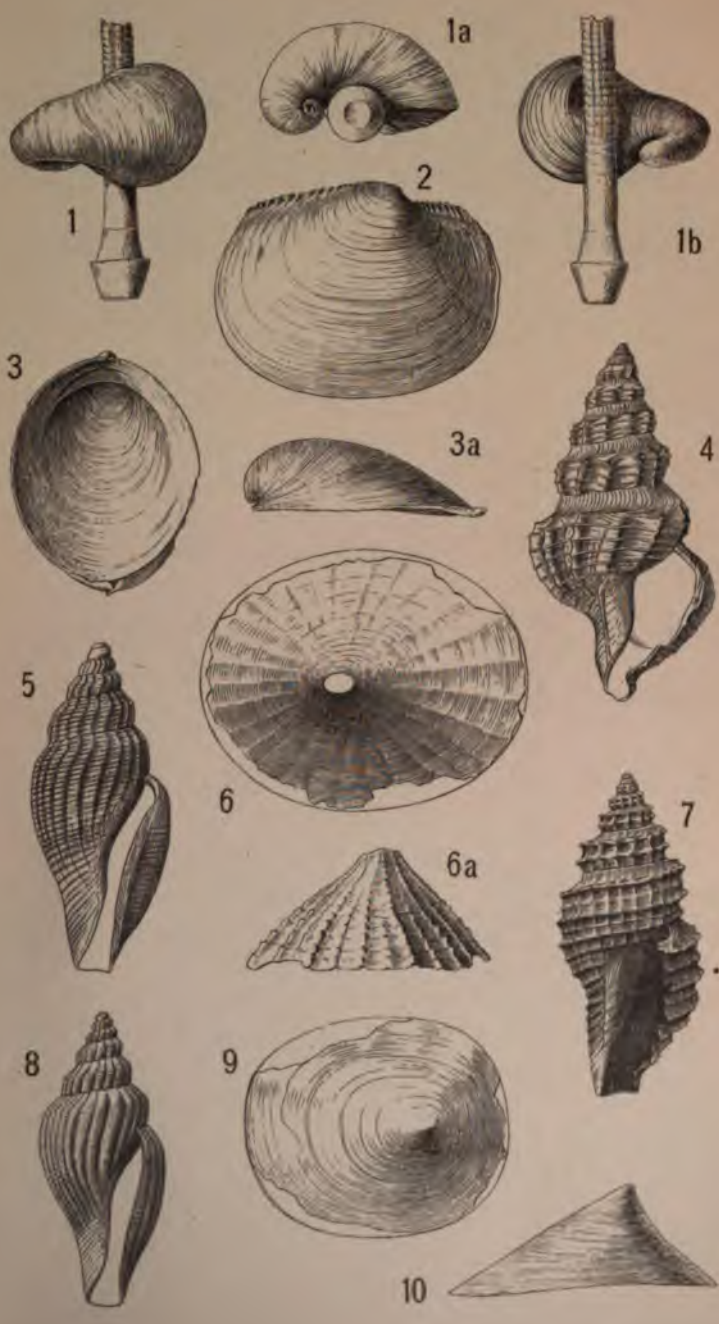
PLATE XIII.



McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XIV.



McConnell del.

PLATE XV.

McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven Conn.

PLATE XVI.

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McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XVII.

McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

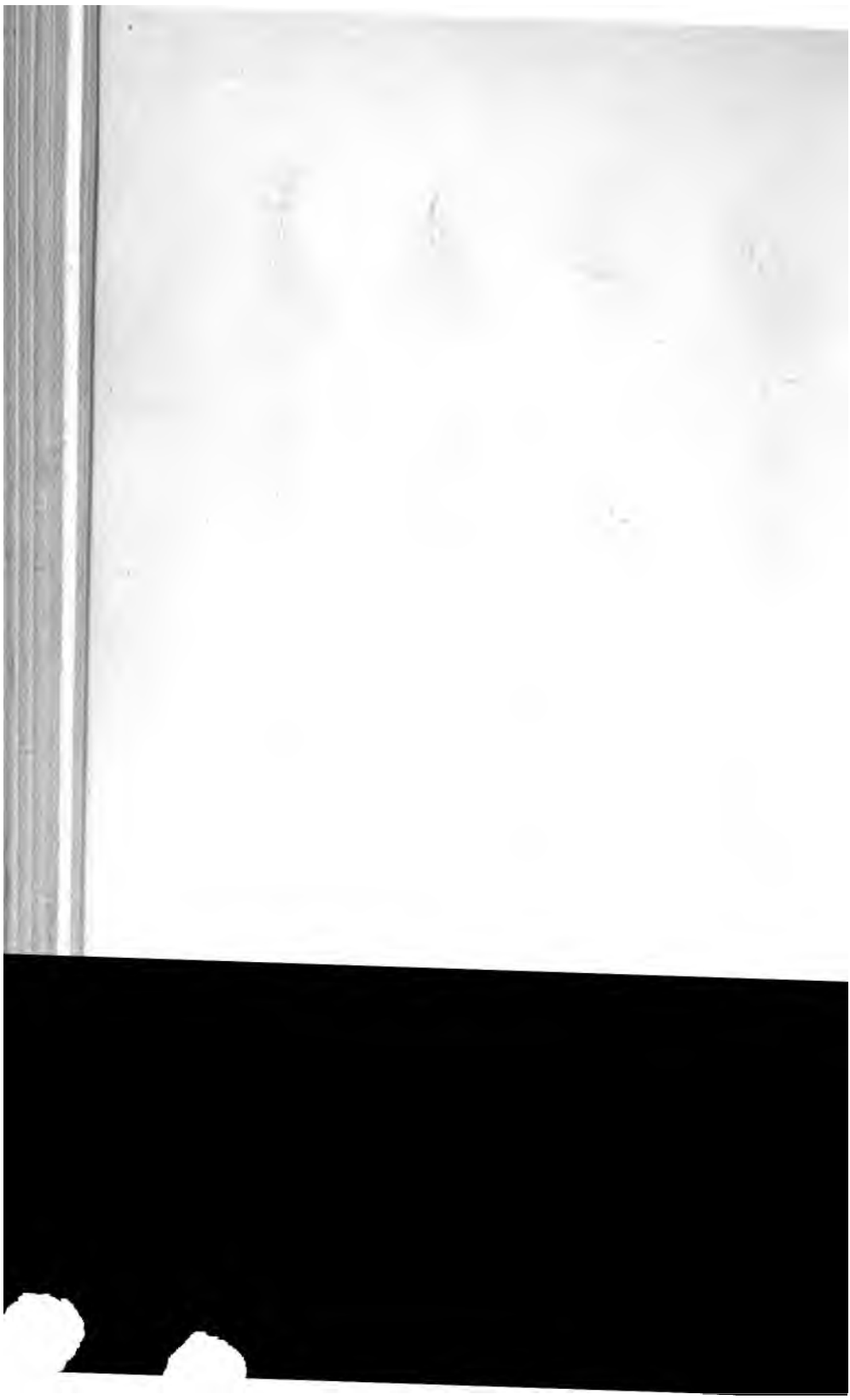


PLATE XVIII.

McConnell del.

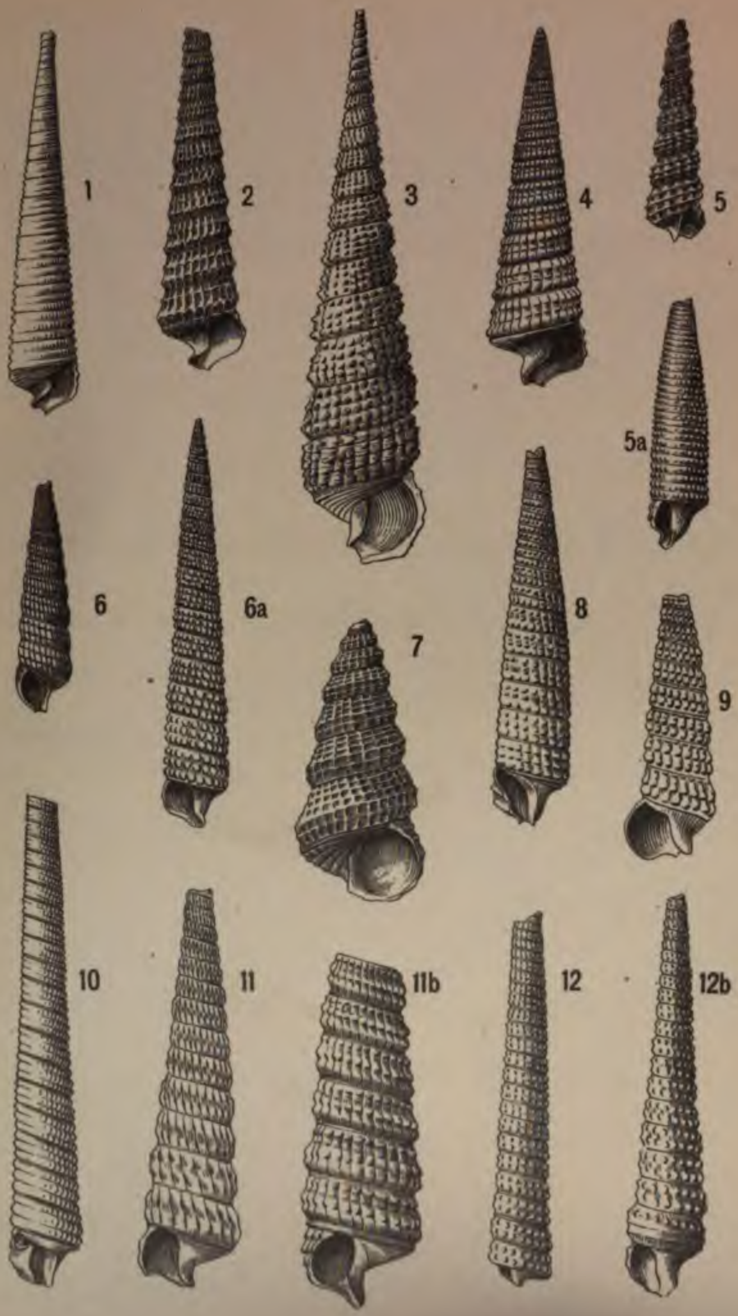
Photo. Litt. by

PLATE XIX.

McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XX.



McConnell del. Photo ... Cano.

PLATE XXI.

McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XXII

McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

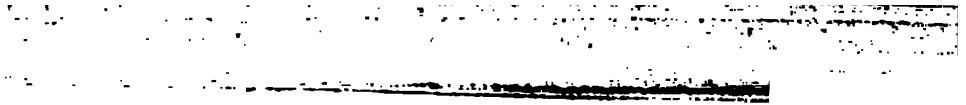


PLATE XXIII.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McConnell del.

Photo Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XXIV

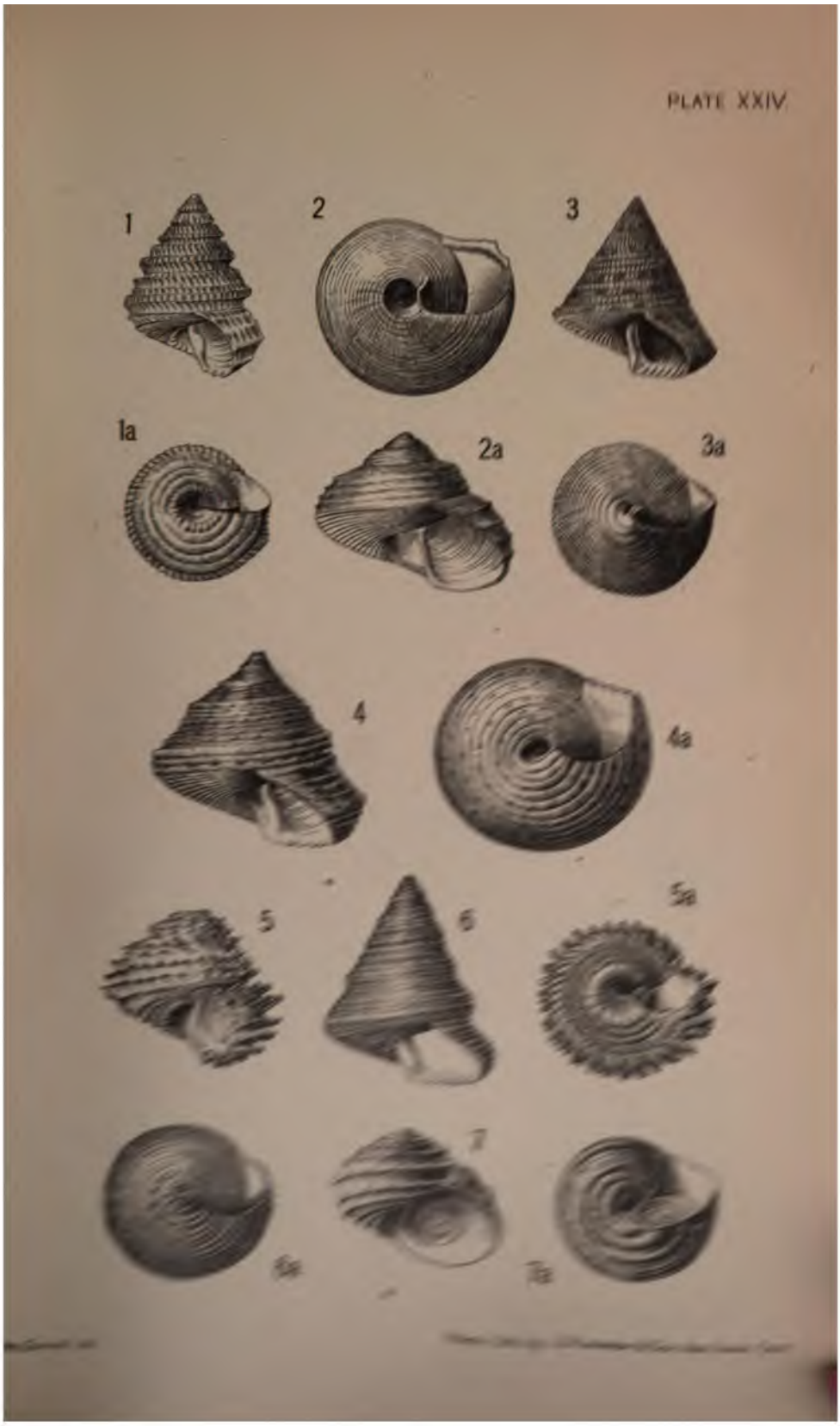


PLATE XXV.

McConnell del.

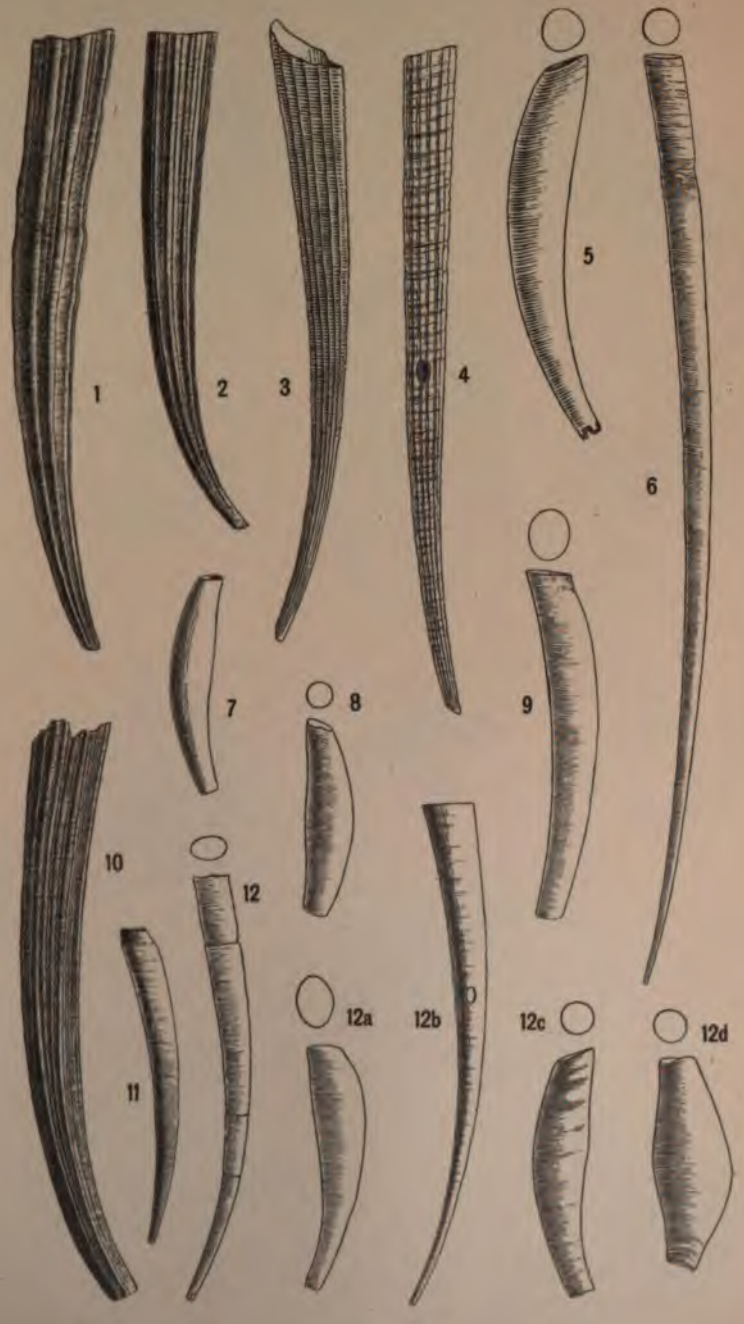
Photo Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XXVI.

McConnell del.

Photo. Lith. by L.S. Punderson & Son, New Haven, Conn.

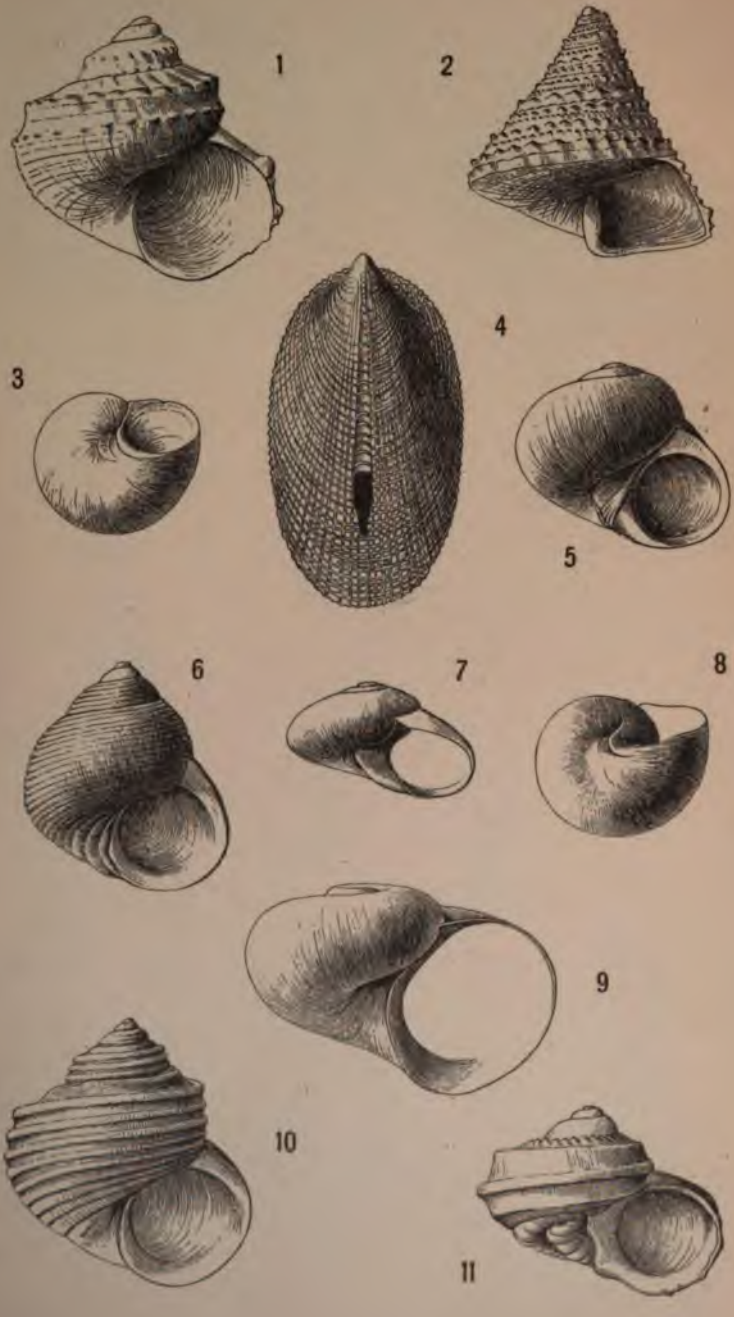
PLATE XXVII.



McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XXVIII.



McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XXX.

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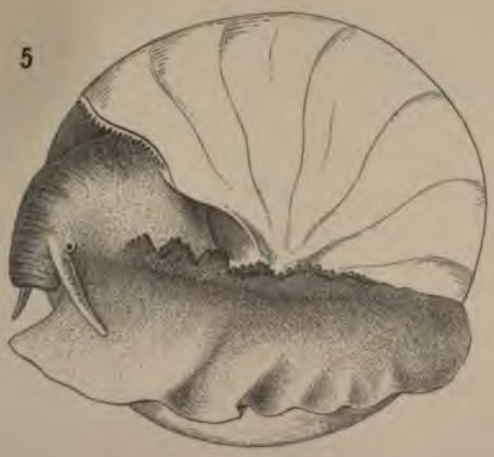

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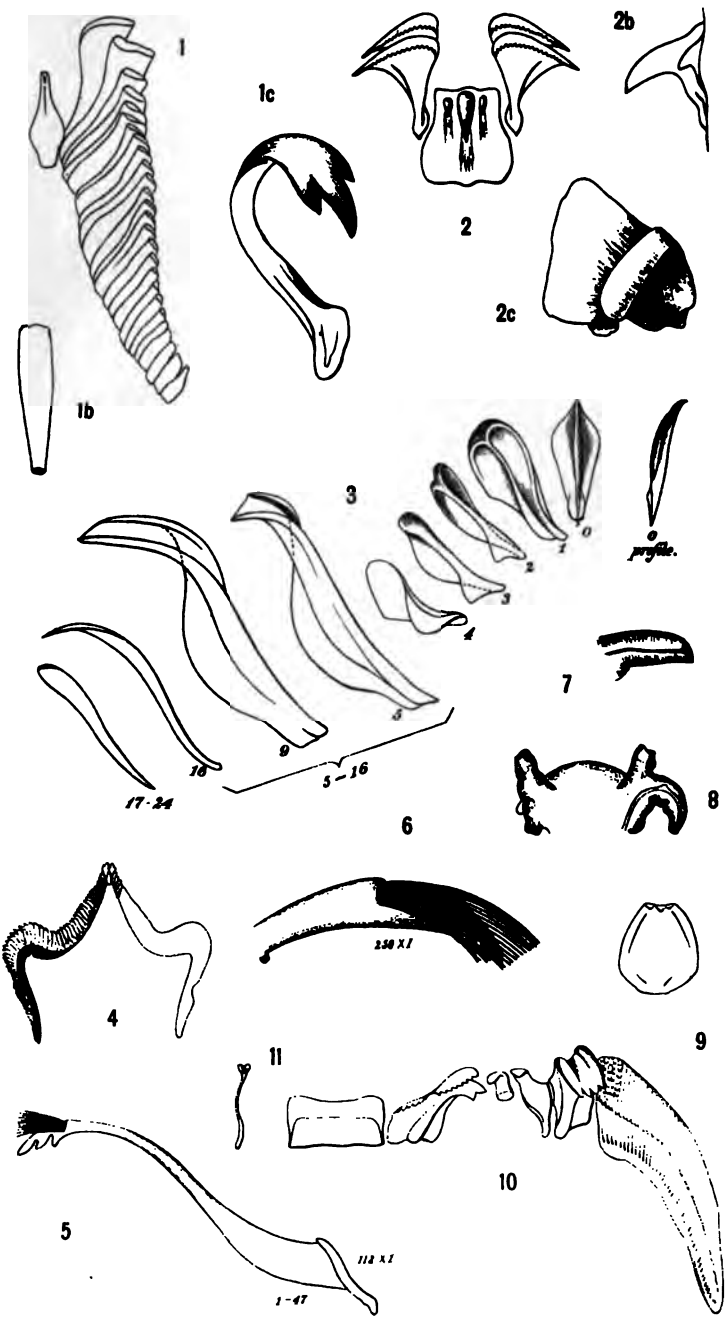
McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

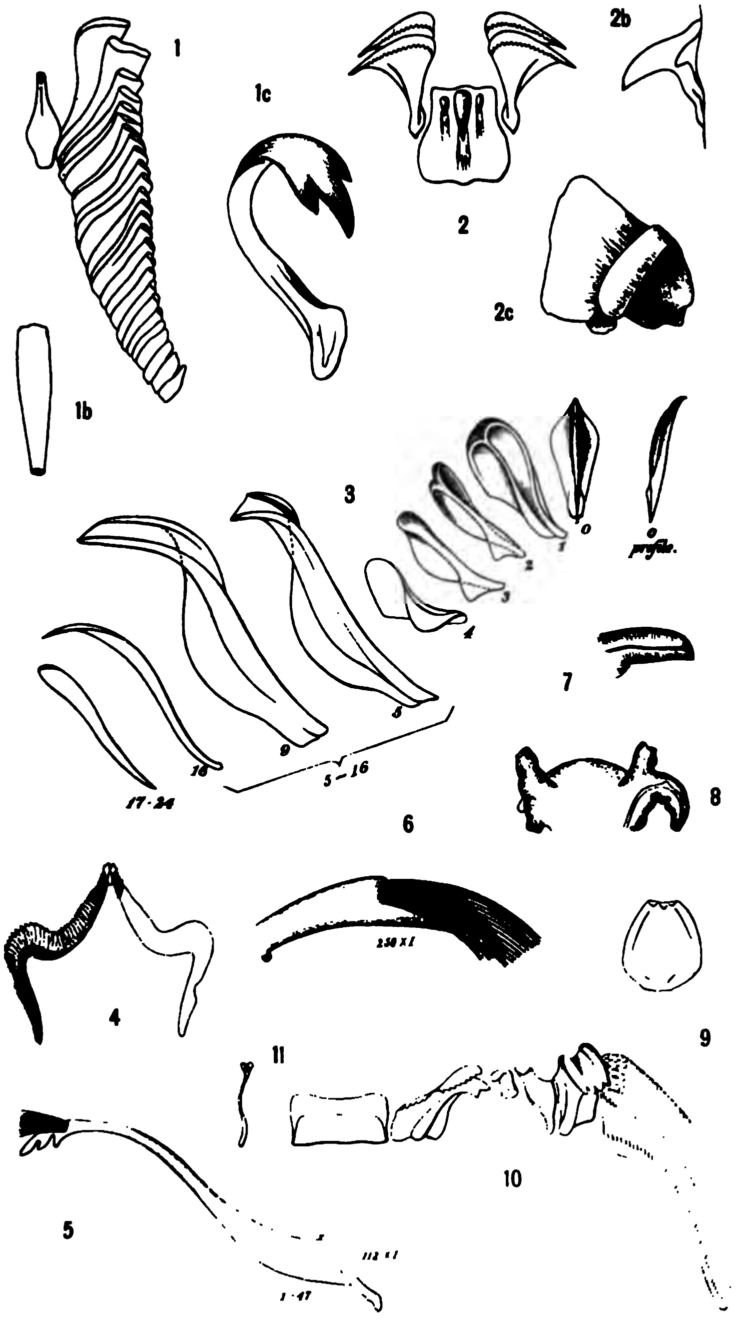
PLATE XXXI.



McConnell del.

Photo Lith. by L. S. Punderson & Son, New Haven Conn.

PLATE XXXI.



McConnell del.

Photo-Lith. by ... New Haven Conn.

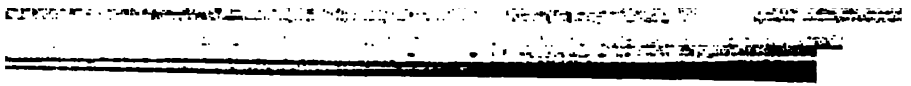
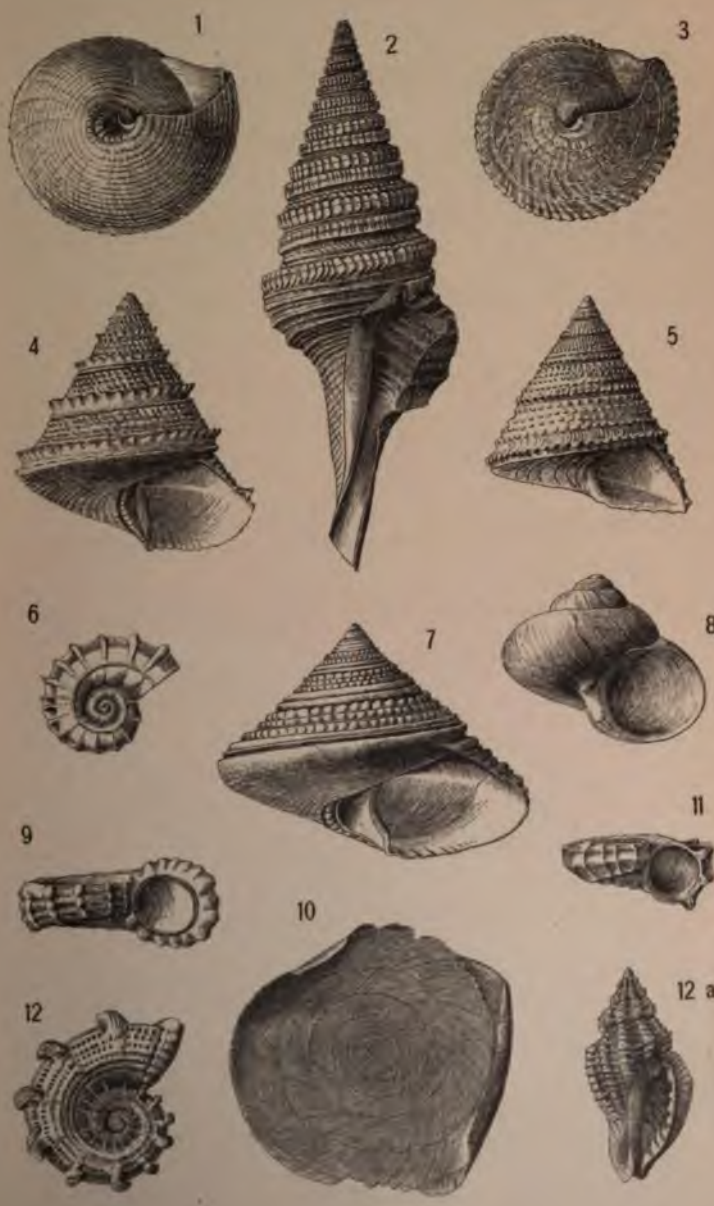


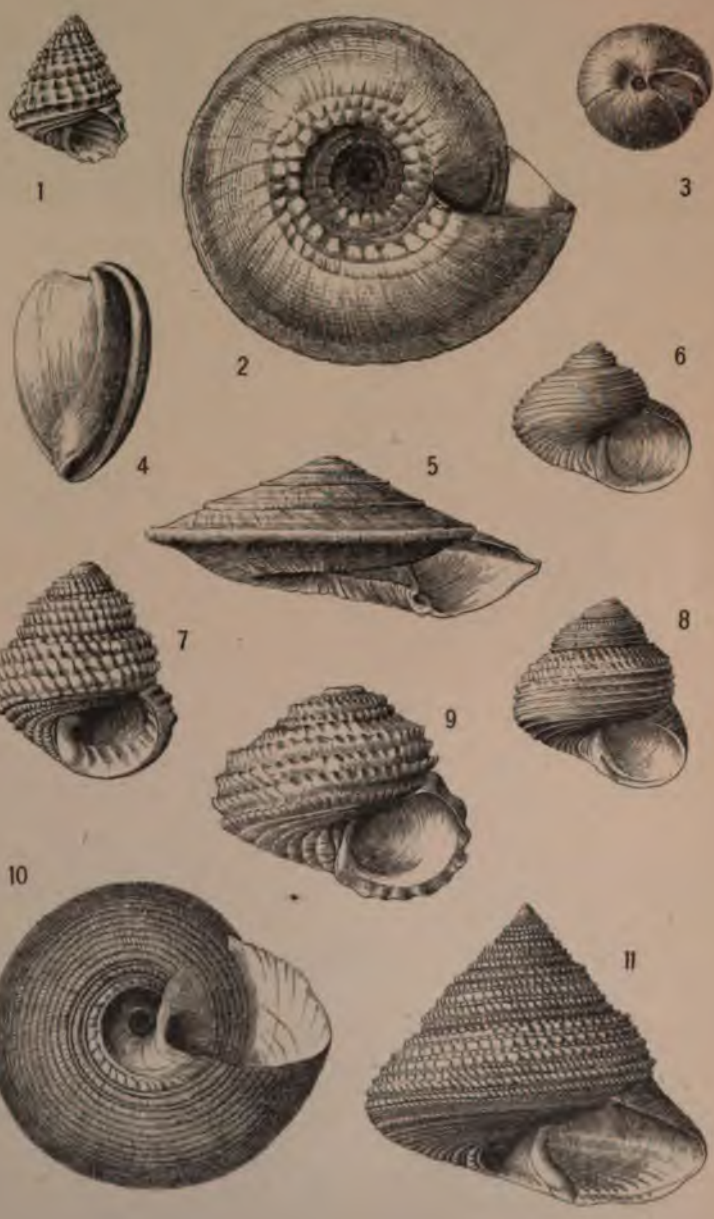
PLATE XXXII.



McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XXXIII



McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XXXIV.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

PLATE XXXV.

McConnell del.

Photo Lith by L. S. Punderson & Son, New Haven, Conn.

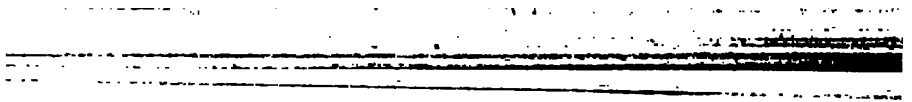


PLATE XXXVI.

McConnell del.

Photo. Lith. by L. S. Punderson & Son, New Haven, Conn.

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McConnell del.

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McConnell del.

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McConnell del.

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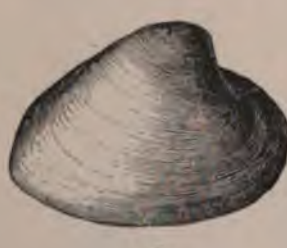

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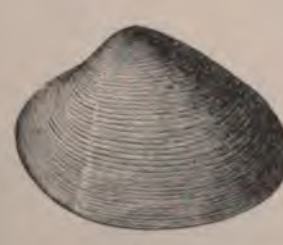

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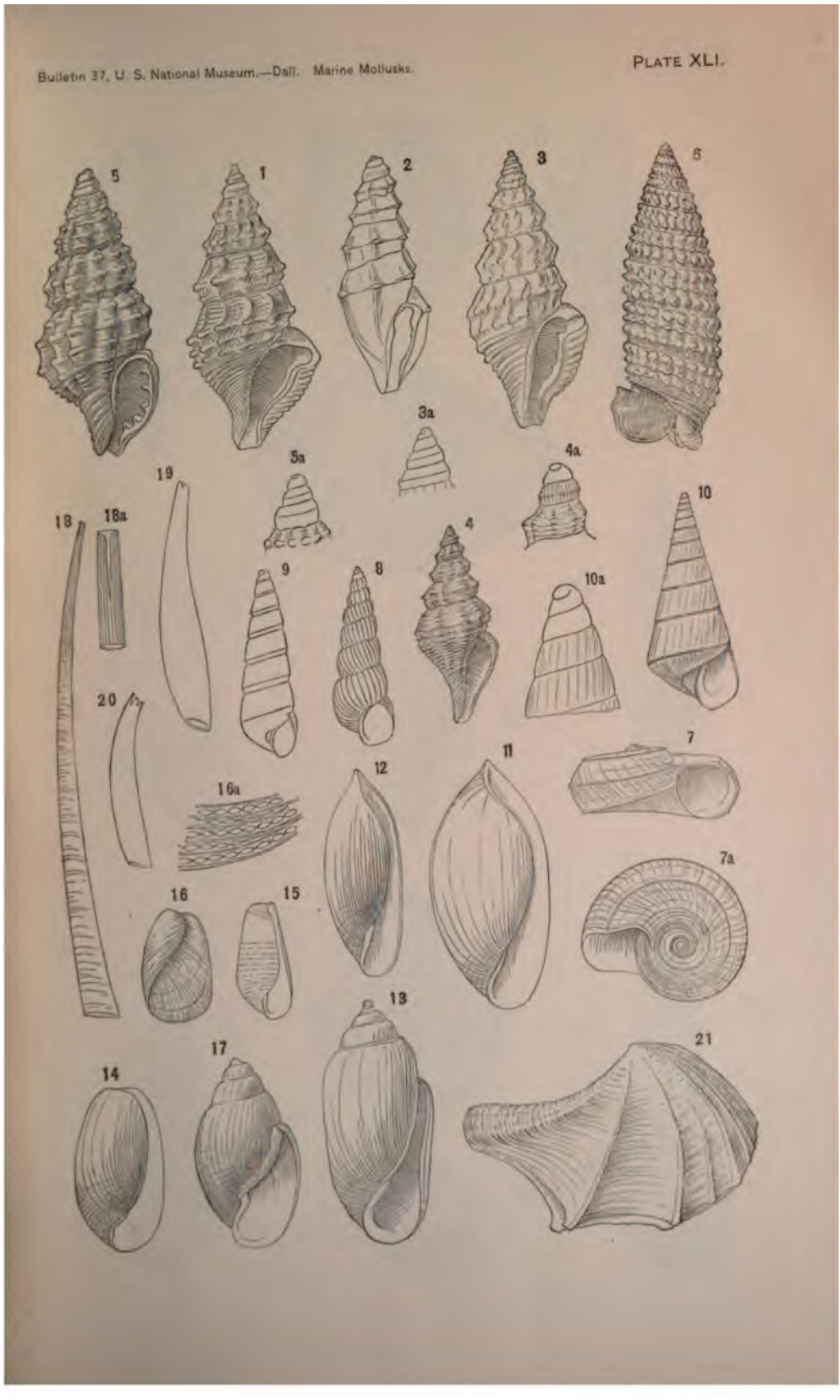
McConnell del.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4a
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18a
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17


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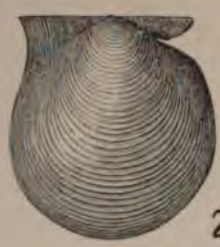
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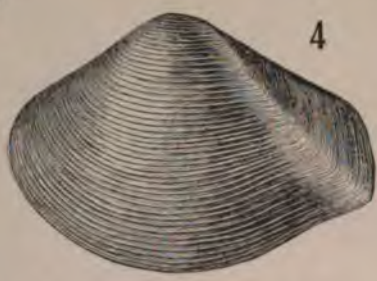
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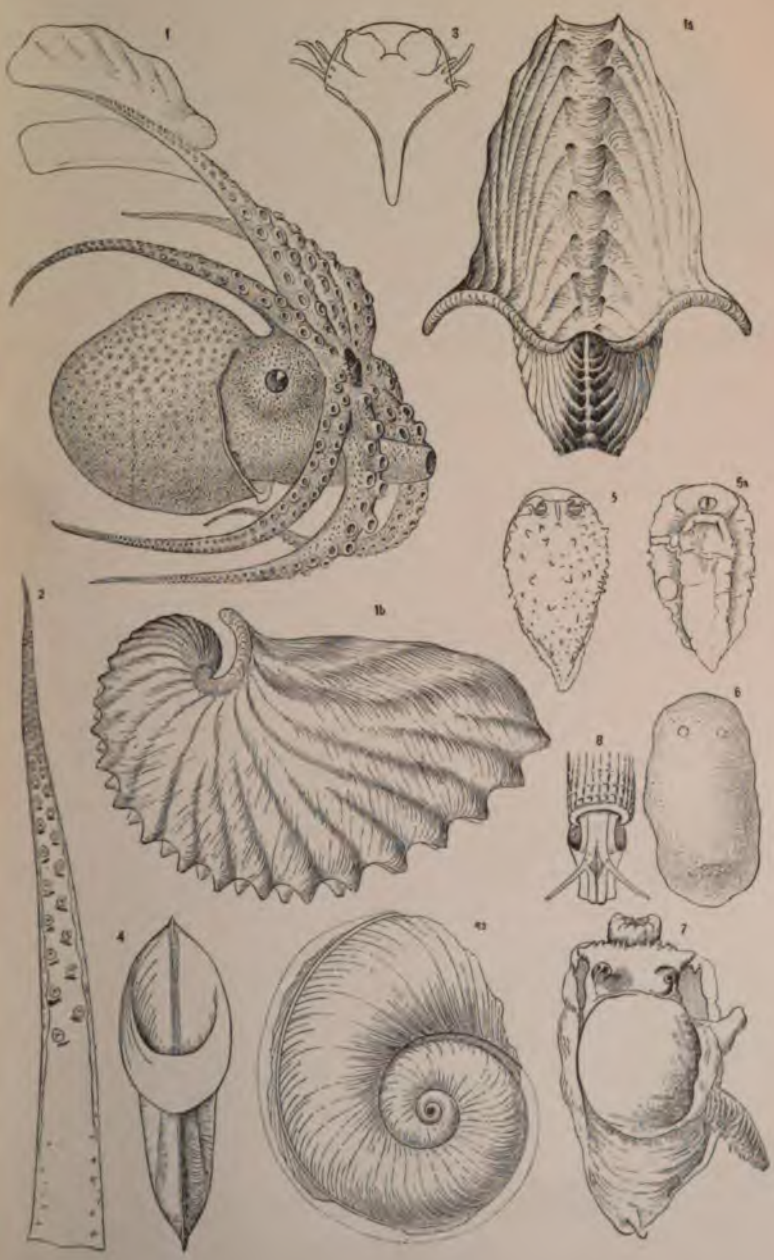
PLATE XLIII.




5
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2a
2b
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11a
11b
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9a
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16a
9b
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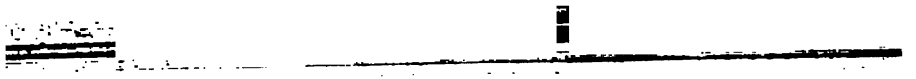
13a




1a
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16a
1b
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2b
2a
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b
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9a
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14a

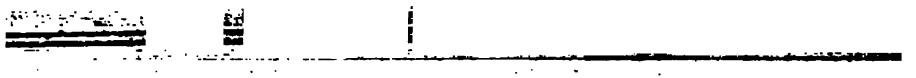
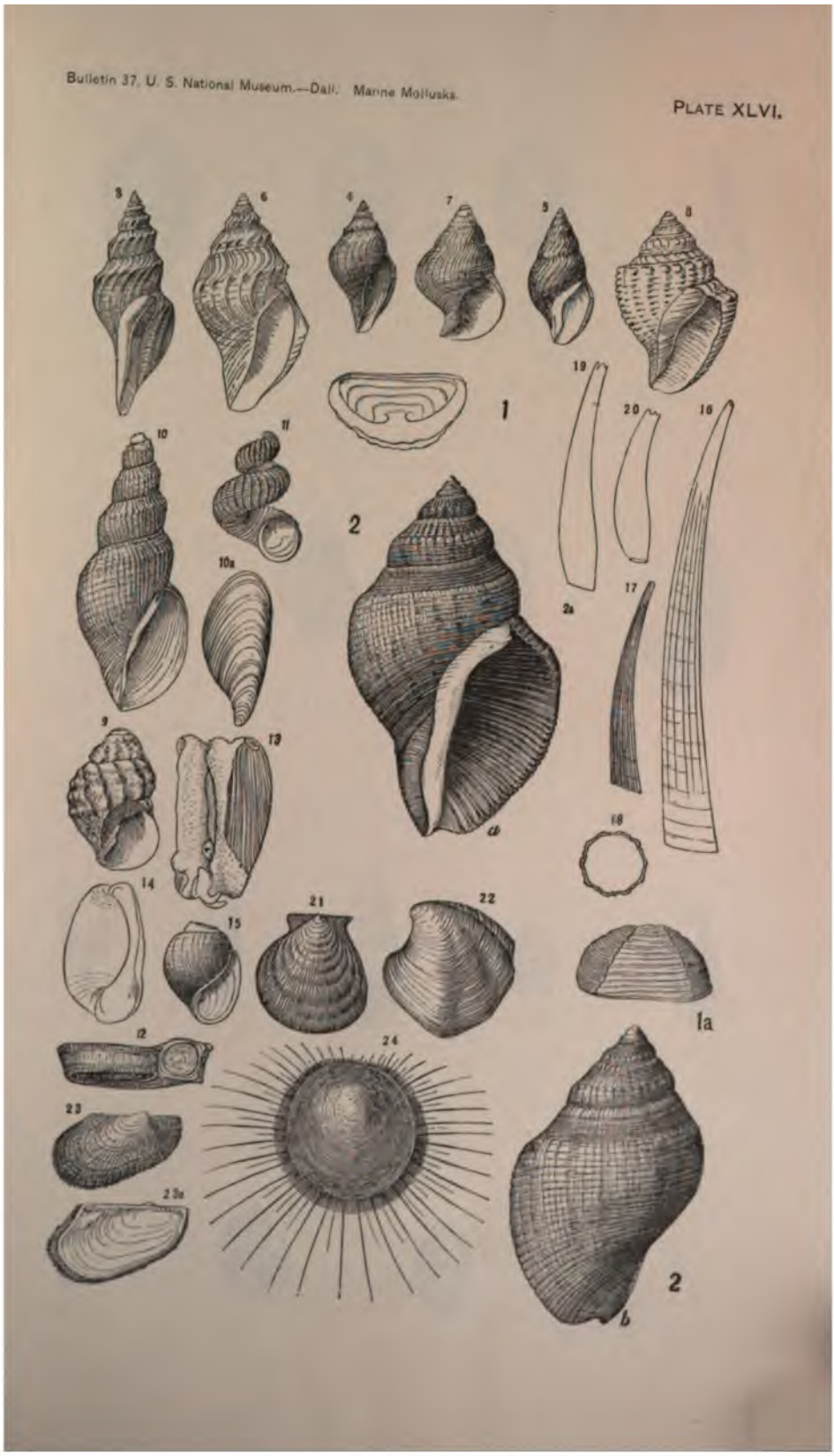


PLATE XLVI.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23a
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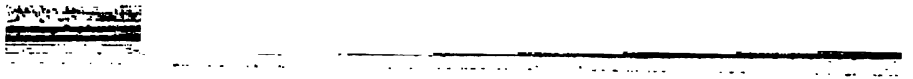

PLATE XLVII.


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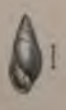
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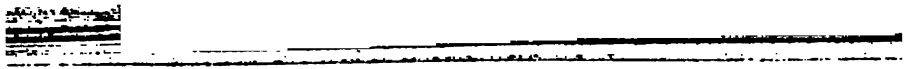

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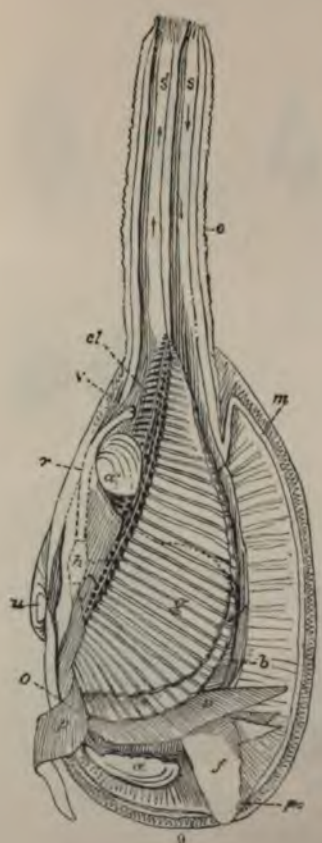

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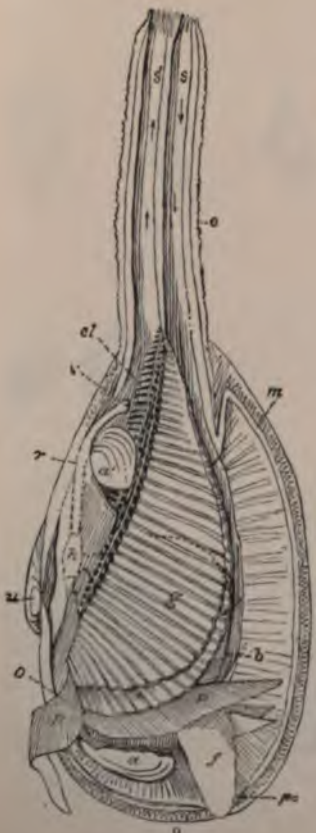

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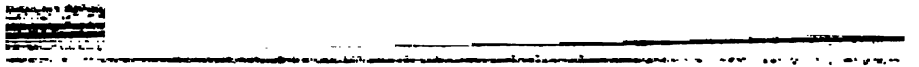

PLATE L.


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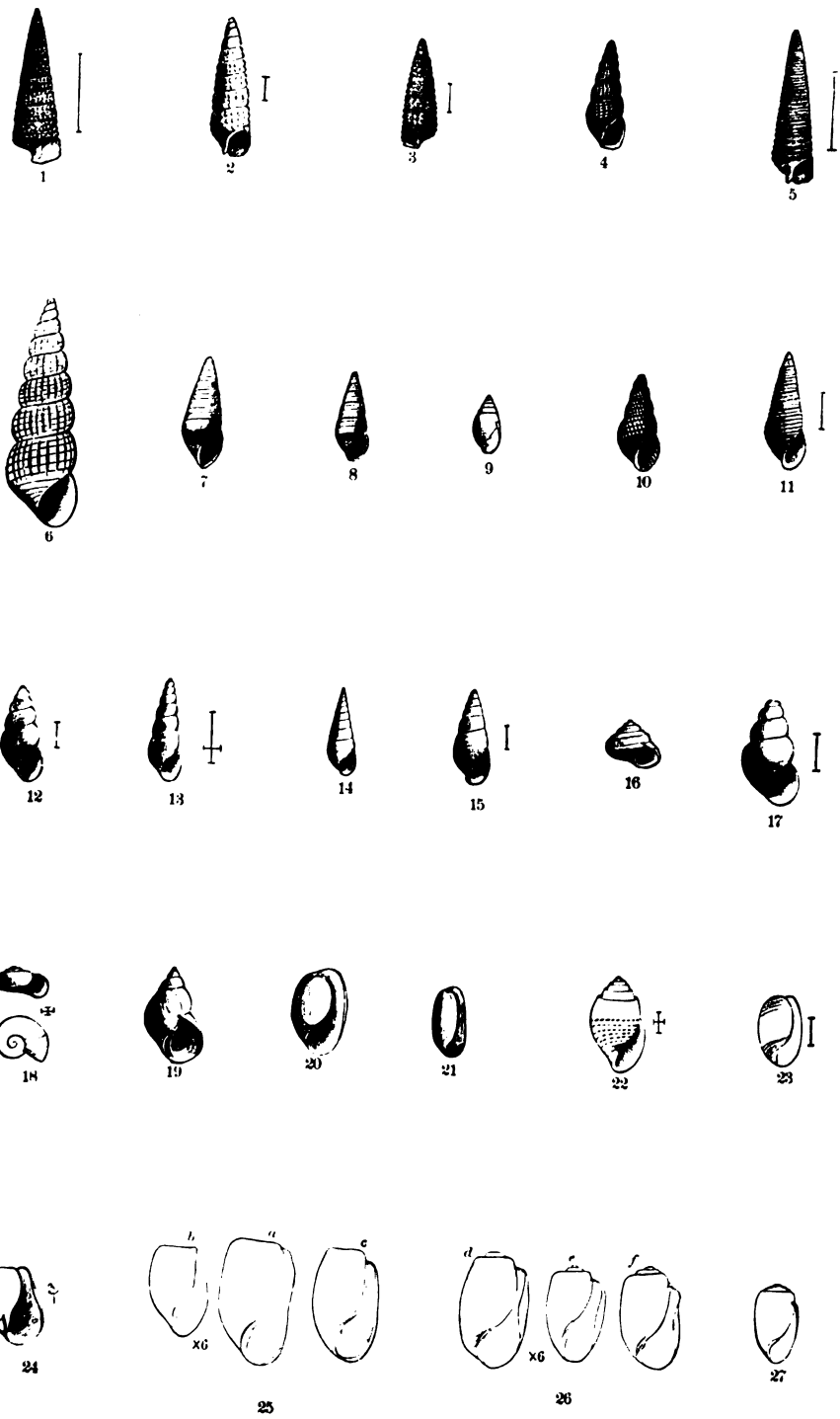
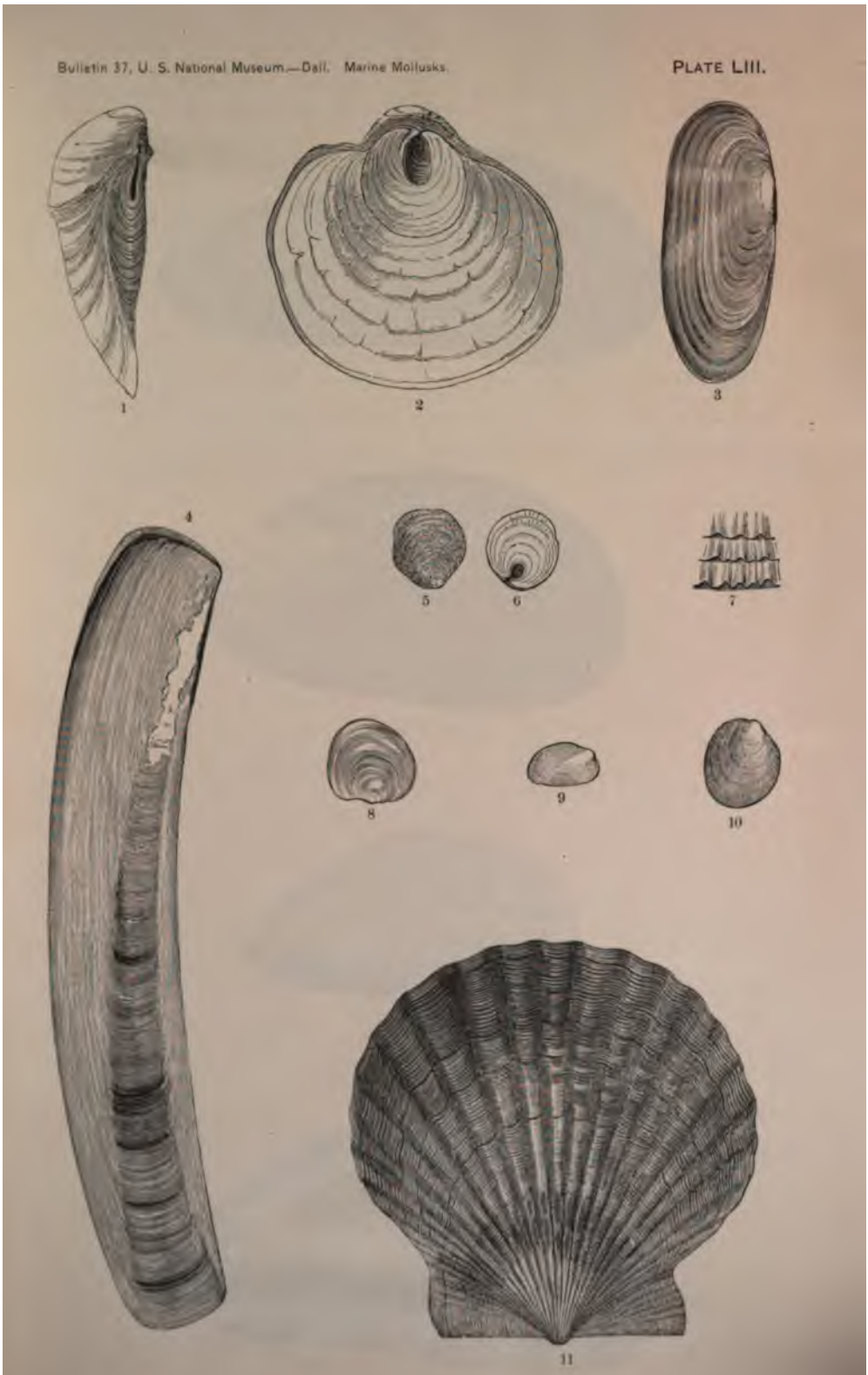
PLATE LII.

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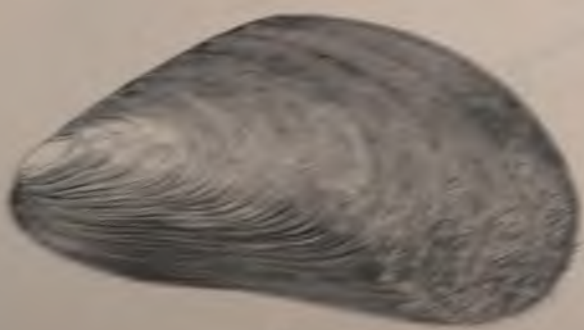

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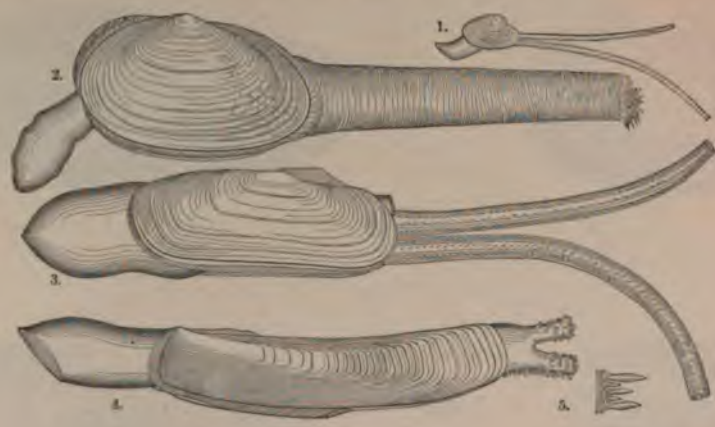
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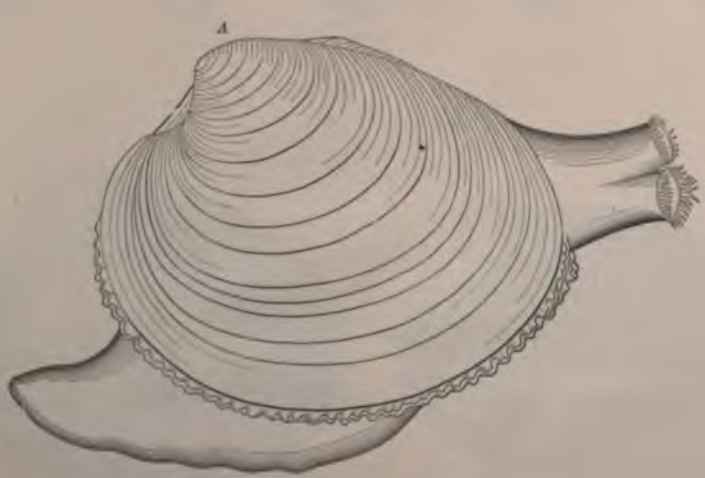
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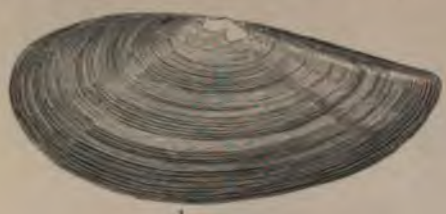
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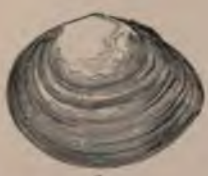
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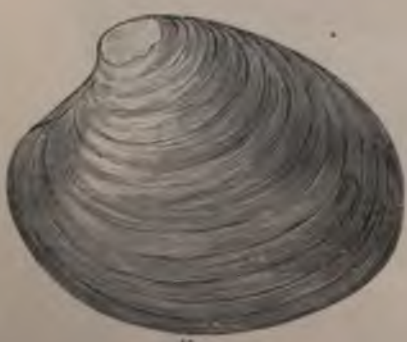
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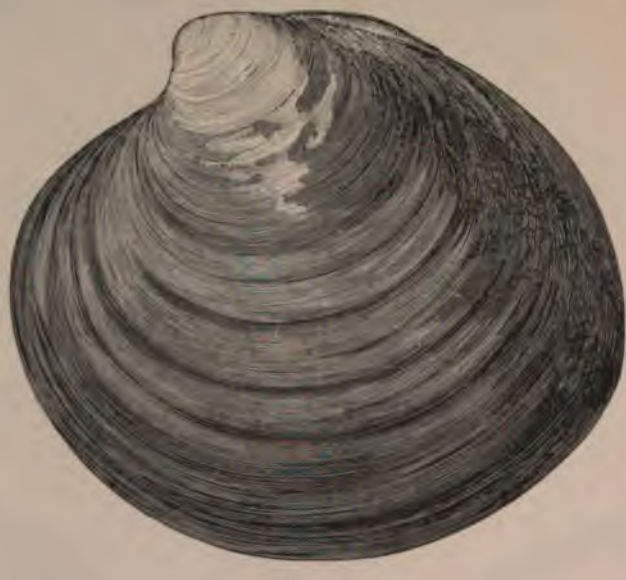

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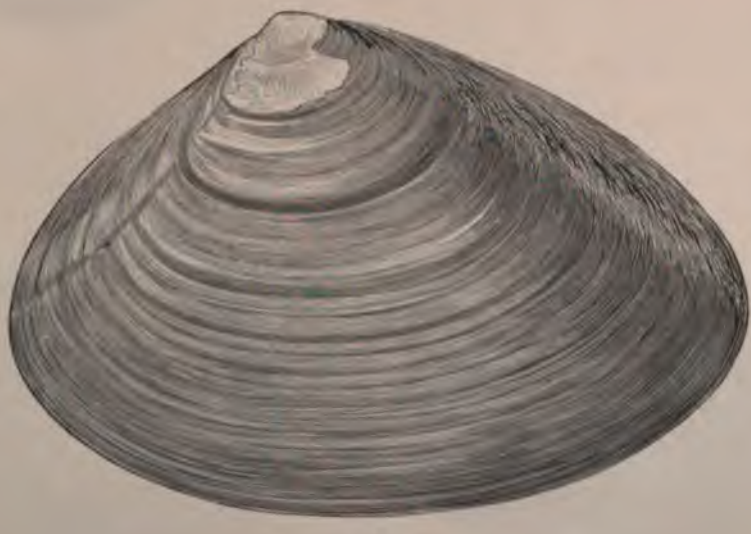

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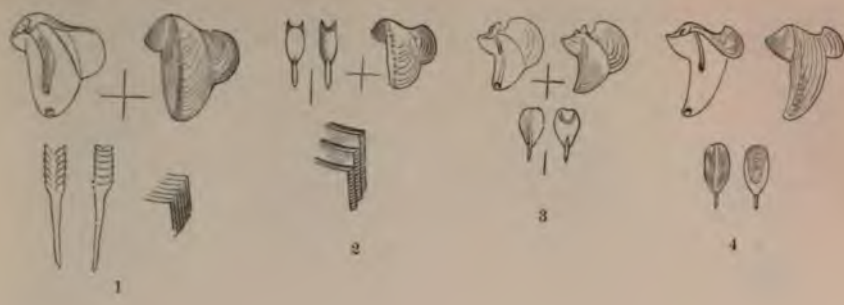
14



1 2 3 4

5 6 7

8 9 10 11

12 13 14 15

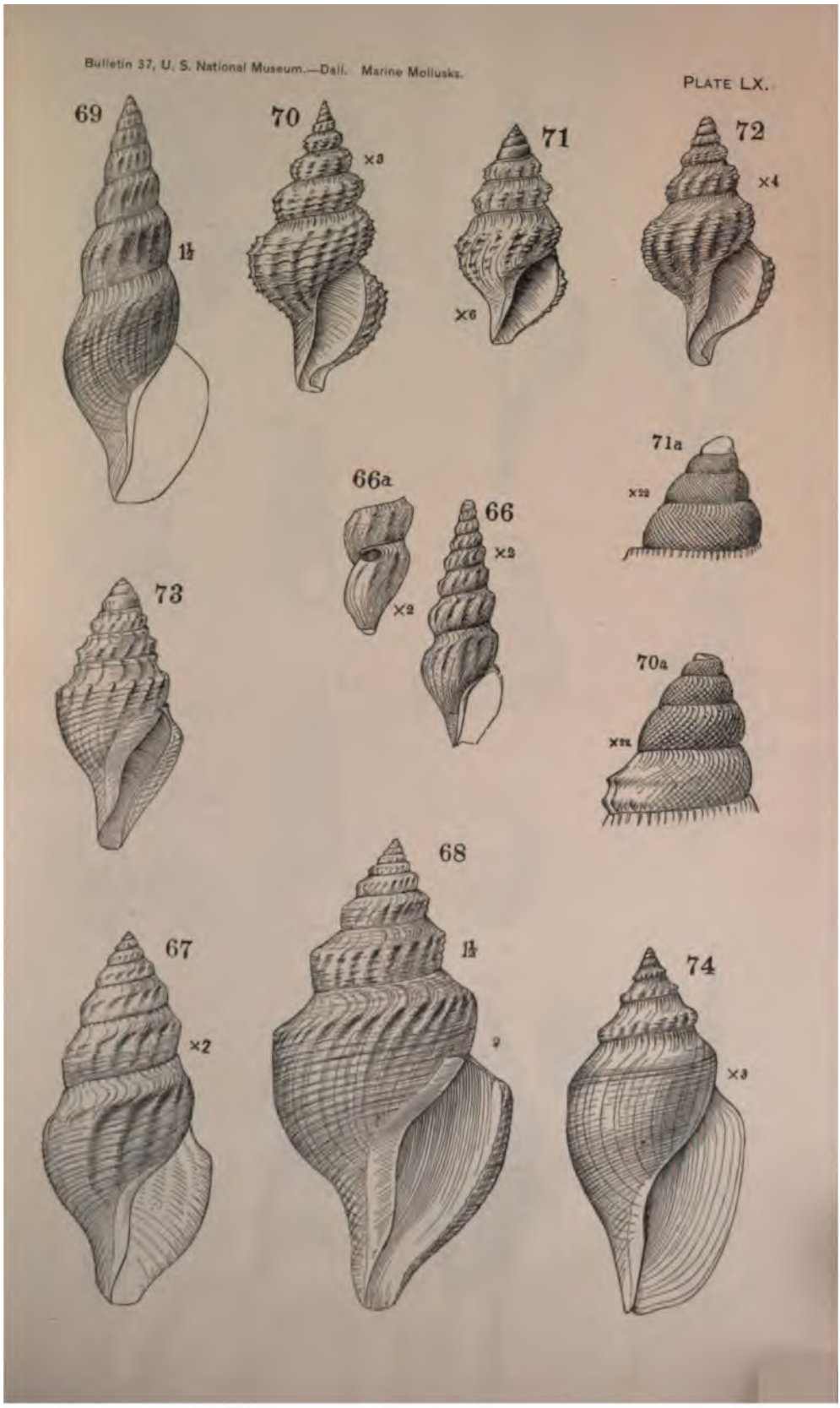
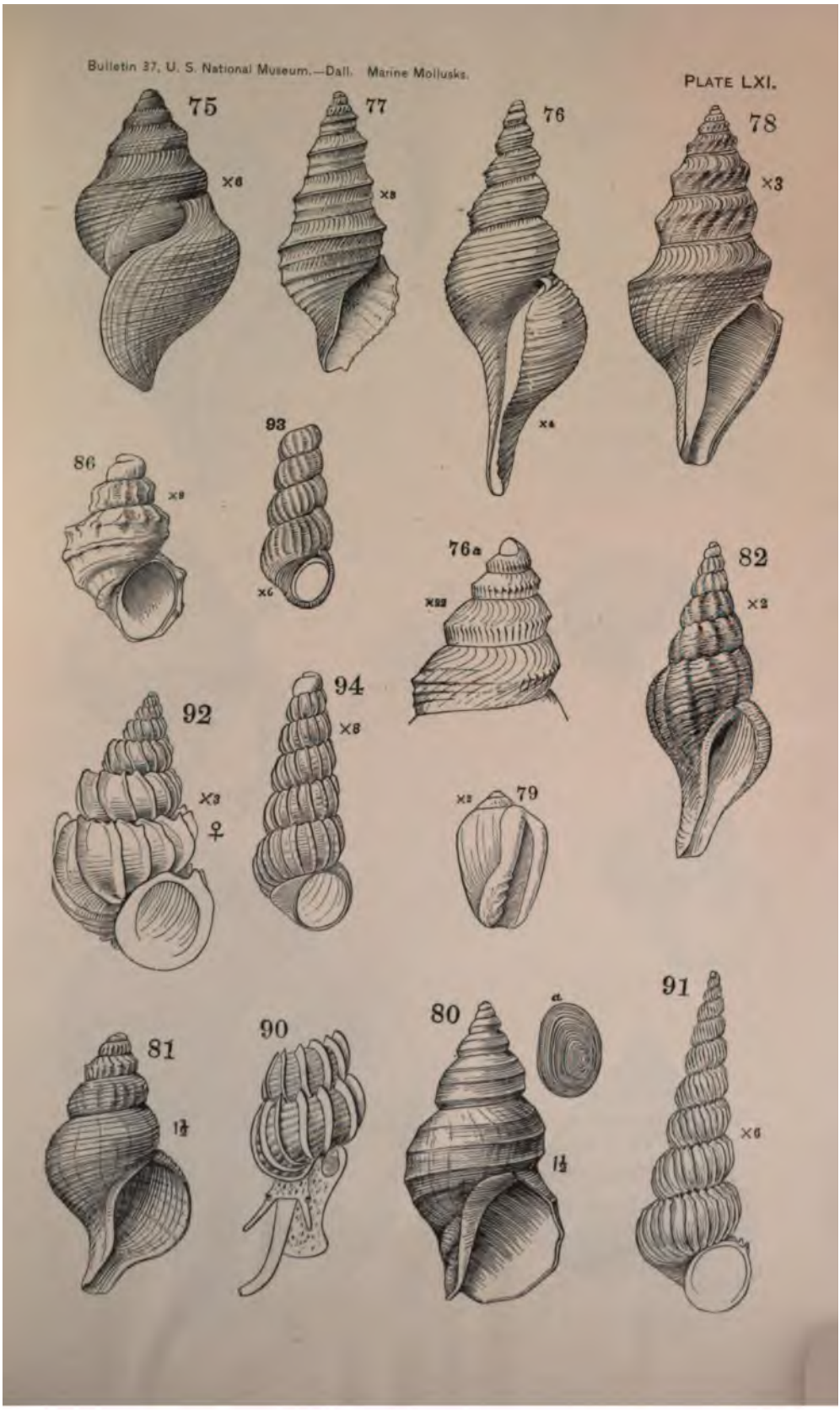
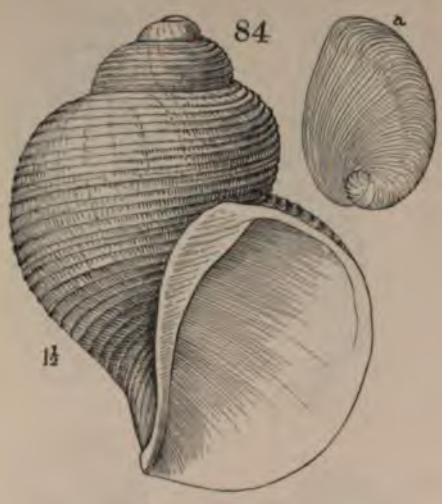

69
1½
70
×3
71
×6
72
×4
71a
×22
66a
×2
66
×3
73
70a
×22
68
1½
67
×2
74
×3

PLATE LXI.




84
a
1½


83a
3/4
3


84b
×100


88
×10

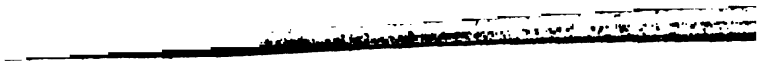

88a

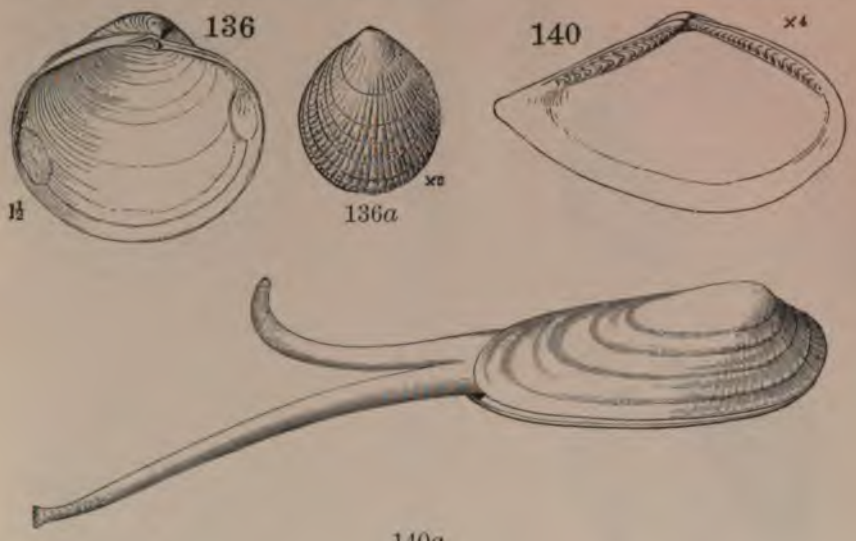

85
×2
♂

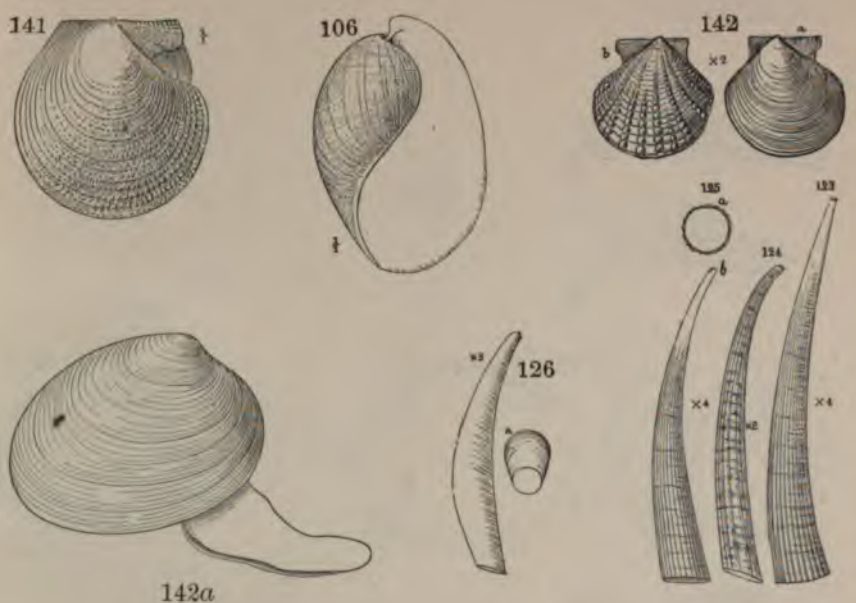

87
×8


83
1½
3


89
×10




136
140
×4
136a
140a


141
106
142
×2
135
133
134
×4
126
142a


142b

136a

140a

142a

142b

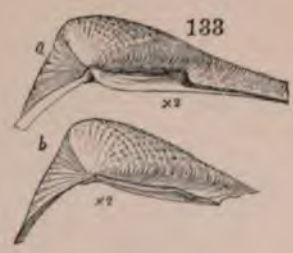

135
1½


127
1


128
×3


128a


132
1½


133
a
×2
b
×2

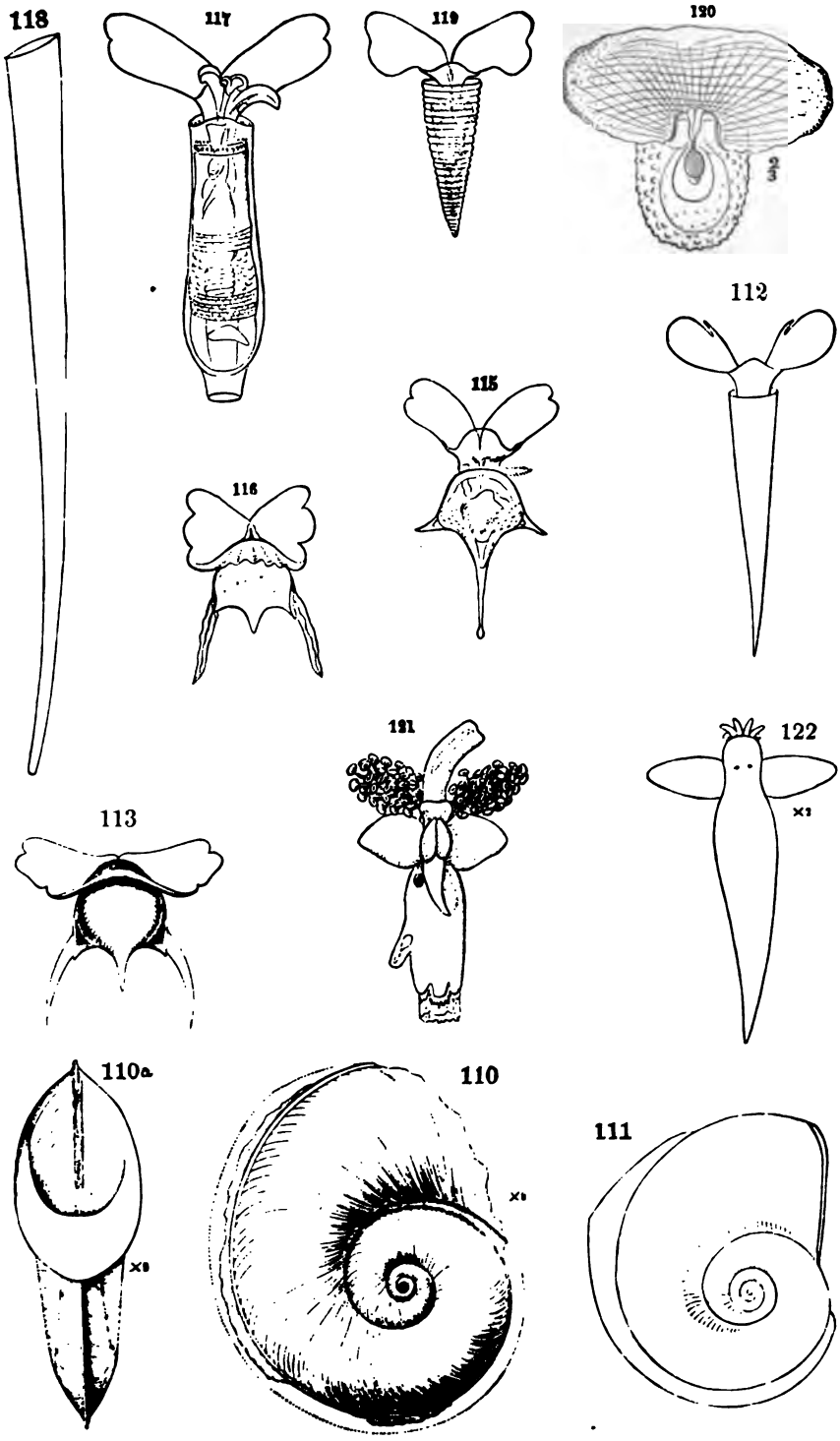

130
1½

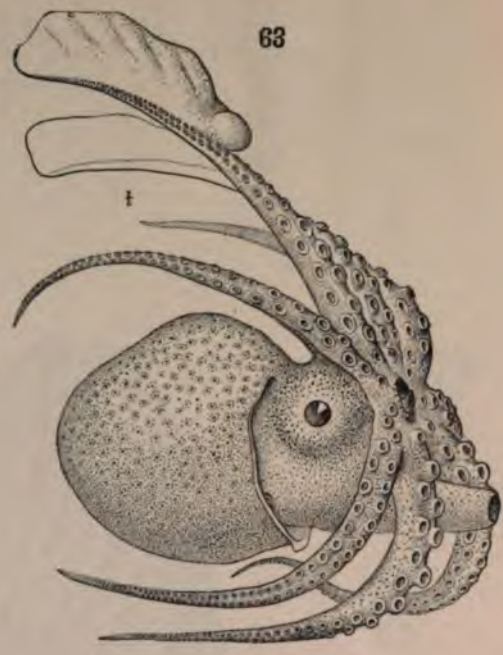

×10
a


131
×10
b


129
×3


134
1½


118
117
119
120
2/3
112
115
116
121
122
×1
113
110a
×3
110
×1
111


63

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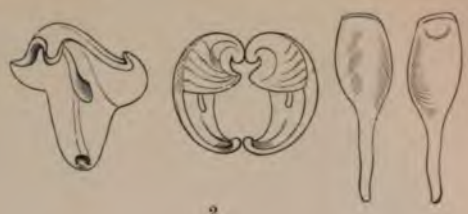

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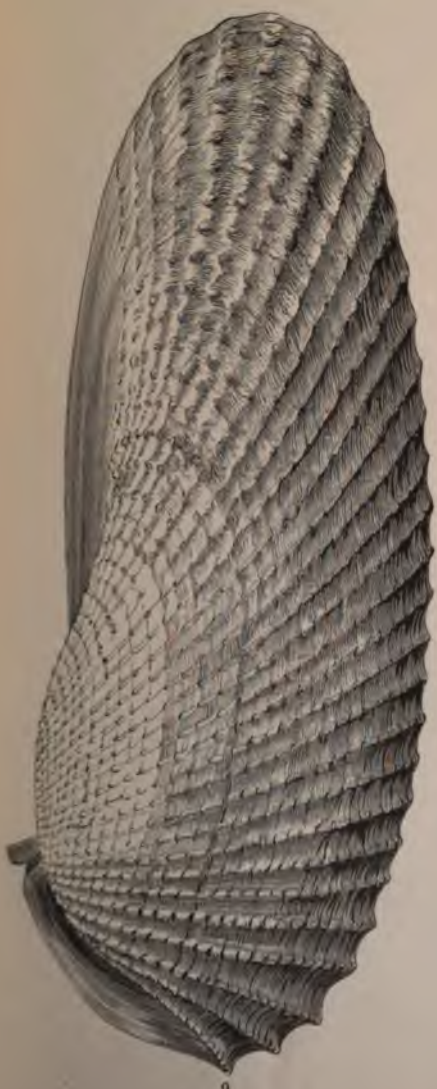
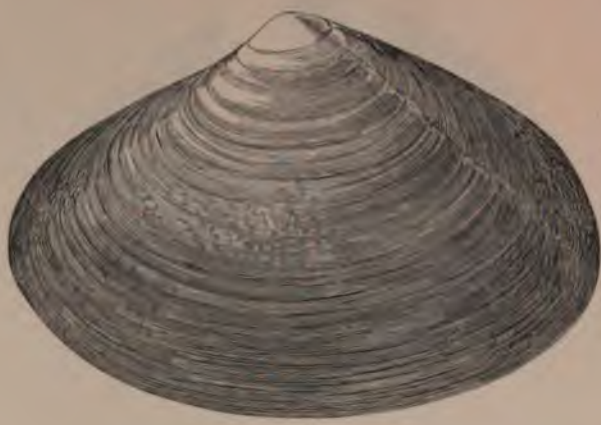


9

10

PLATE LXX.



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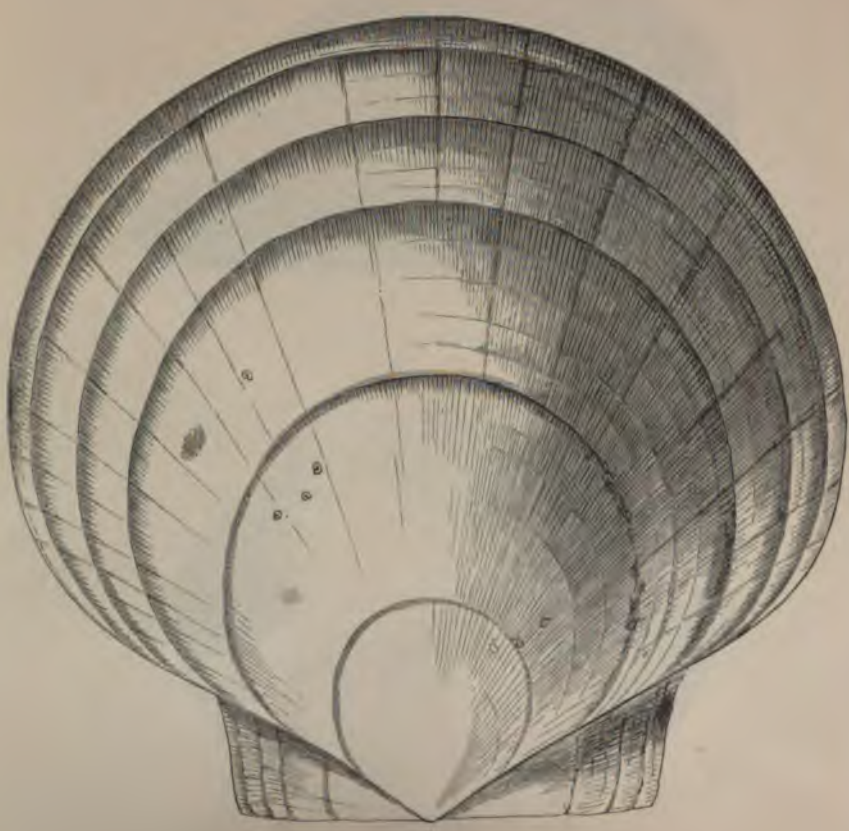

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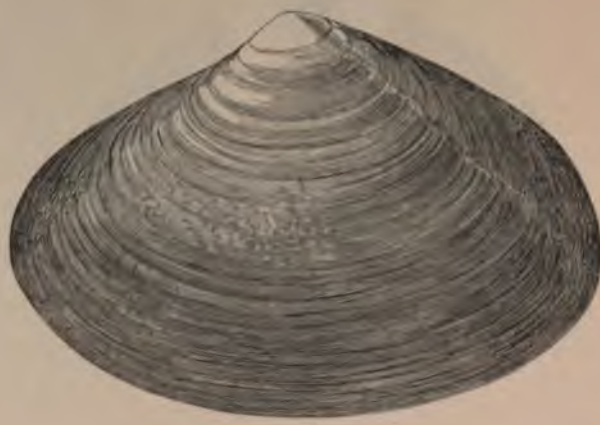

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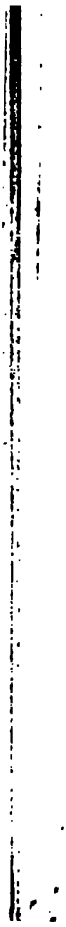

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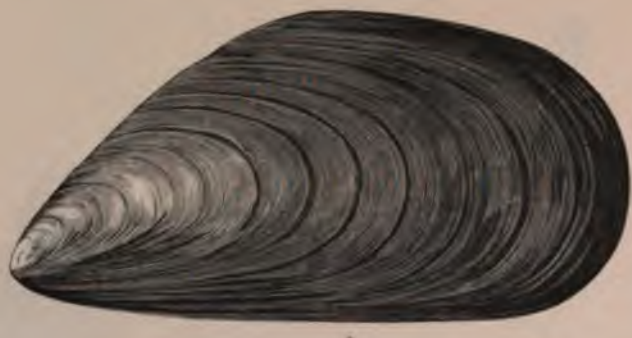

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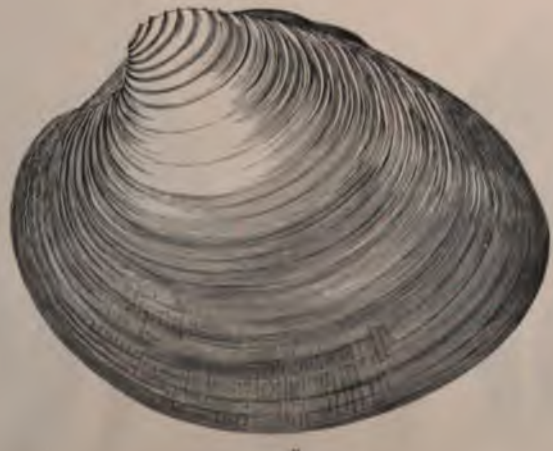

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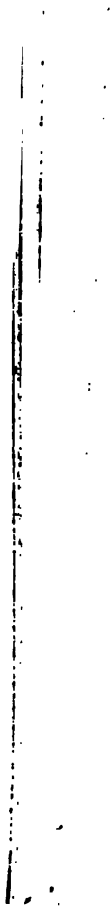

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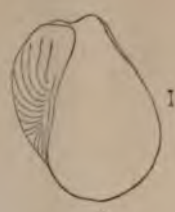

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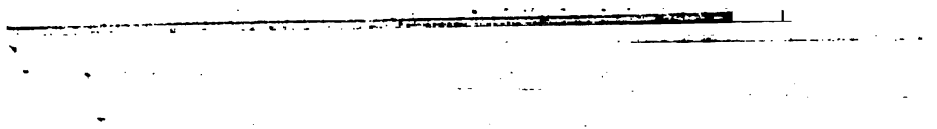
11

12



1